

A balanced energy mix will fix crisis, not just renewables

South Africa's commitment to achieving net zero emissions by 2050 is being threatened by the country's ongoing power crisis. In response, the cabinet has recently approved the [Just Energy Transition Implementation Plan \(JET IP\)](#). This plan aims to guide the country's transition to a low carbon economy by scaling up renewable energy sources, while also addressing the country's energy needs and promoting inclusive economic growth and employment. However, experts argue that a more holistic solution would involve a balanced portfolio that includes nuclear power.



Dr Andrew Dickson, an engineering executive at CBI-electric: low voltage. Source: Supplied

Dr Andrew Dickson, an engineering executive at CBI-electric: low voltage, explains that nuclear power plants provide a stable base load supply of energy.

He further adds that, unlike renewable energy projects, which are currently constrained by transmission grid capacity in resource-rich areas such as the Northern Cape, the Western Cape, and parts of the Eastern Cape, nuclear power plants can be constructed in areas with greater grid capacity. This, he suggests, could be a viable solution to the country's energy crisis.

"Conversely, renewable energy sources like solar and wind have output gaps when the sun sets, or the wind stops blowing and therefore require backup power or energy storage solutions," explains Dickson.

"Additionally, a typical nuclear reactor easily produces 1GW of electricity per plant and requires about 3.4km² of land to do

so, whereas solar farms need between 116km² and 200km² to generate the same amount of electricity and 670km² to 930km² for wind.”



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Highlighting the role it could play in combating climate change, Dickson notes that nuclear power plants reportedly emit no greenhouse gases during operation.

“Over the course of their lifecycle, nuclear plants are said to produce about the same amount of carbon dioxide equivalent emissions per unit of electricity as wind, and one-third of the emissions per unit of electricity when compared with solar” he says.

“This does not take into account the carbon emission footprint of grid-scale battery storage, including all steps in the manufacture of the battery from mining and refining of the materials used through to recycling the battery once it comes to the end of its lifespan.”

French connection

In France, for example, 88% of electricity is produced from zero emission sources with nuclear accounting for 63% of its energy mix and wind at 12%. This has led to the country becoming the European Union’s largest producer of zero emissions power and being far ahead of other EU countries in decarbonising electricity.

“ France has committed to fully decarbonise electricity by 2035 and will phase out coal entirely by 2024. ”

“Despite all this, South Africa only makes use of 1.9GW of nuclear power versus 3.4GW of wind and 2.3GW of solar,” he points out.

“While there are concerns about the safety of nuclear power, largely due to two major accidents - Chernobyl in Ukraine in 1986, and Fukushima in Japan in 2011 - this does not compare to the number of deaths that are caused annually from pollution from coal-fired plants.”

A [report by the Centre for Research on Energy and Clean Air](#) found that Eskom’s coal power stations alone are responsible for approximately 2,200 deaths every year.

“ Nuclear has actually been deemed one of the safest sources of energy - even more so than wind. ”

“And while it takes on average around eight years to build a nuclear reactor versus two to six months to construct a wind farm and eight to 12 months for a solar farm, delays in the Renewable Independent Power Producer Programme have meant that these projects aren’t being built much faster,” highlights Dickson.

“Additionally, with nuclear plants, we will be able to generate gigawatts of electricity unlike renewable projects which only produce a couple hundred megawatts in some cases.”

“By increasing the amount of nuclear power in South Africa’s energy mix, this could help to ensure a bigger, better and more stable baseload, which in turn will help to bring about an end to load shedding, spur economic growth and enable us to uphold our net zero emissions commitment,” he concludes.

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