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# ELECTRICITY DEMAND

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A Quick Read

**Dirk de Vos**

5/5/2017

## Electricity Demand – A Quick Read

The recent Cape High Court decision setting aside the previous Energy Minister's decision to proceed with nuclear procurement, as well as the international agreements signed to initiate the process, is to be welcomed. But the judgement was mostly based on several procedural grounds and legality. It did not have to deal with any of the substantive issues.

At some point, another determination for the procurement of electricity generating capacity will have to be issued based on future demand. At present, energy planning and projections of future demand are done in terms of the Integrated Resource Plan for Electricity (IRP). Right now, the Department of Energy is supposed to be compiling their responses to public input on the most recent draft IRP first published in November last year. It was received with some controversy, including because the least cost option was excluded. But the question of the projected demand for electricity received less attention. IRP planning recognises that unserved demand can heavily constrain economic growth, but also that future demand for electricity does not grow lock-step with economic growth. Increasing efficiencies means less energy intensity. What is not properly examined are the severe economic consequences of overstating projected demand.

Measured against our GDP, South Africa is an extremely energy-intensive country. The problem is a direct result of the over-investment in generating capacity, based on large coal-fired power stations established by the Apartheid government, particularly in the 1970's and 1980's. The purpose of the massive investment was to develop South Africa's mining-based economy. The eventual consequences of the over-investment at the time were a massive increase in government borrowing, surging prices for electricity, and the consequent mothballing of many generators by the time they were ready for service, as it would not have been affordable or feasible to operate them. This was a result of poor energy planning, and the foreign debt incurred by the Apartheid regime precipitated a crisis which eventually contributed to bringing the Apartheid government to its knees. It is in nobody's interests that a democratically-elected government is brought down by the financial impact of an ill-considered trillion rand nuclear procurement process. Fortunately, we have a Constitution which provides some protection against the decisions that are irrational and made without the required public input.

Our legacy of over-investment in generating capacity had another lasting negative impact. Having amortised our Apartheid era debt, Eskom set about finding customers for its excess (mothballed) capacity, skewing industrial policy towards one that was based on large amounts of the cheapest electricity in the world. Inevitably, the type of customers drawn to this included large aluminium smelters processing bauxite mined in Australia, who immediately exported the aluminium with minimal value-add or job creation in our economy. South Africa's electricity intensity grew to being among the highest in the world. The strategy was unsustainable as Eskom did not concern itself with maintaining its asset base. Despite government policy to restructure the electricity sector, seemingly endless supplies of cheap Eskom electricity prevented the implementation of sensible reforms. As predicted, by 2006, a shortage of capacity led to the first incidents of "loadshedding".

One feature of the IRP processes since 2010 is government's consistent over-estimation of electricity demand. This is very important. If demand comes in less than forecast, then Eskom's tariffs need to be adjusted so that it recovers its costs from a smaller amount of electricity supplied. Increased tariffs work to depress demand even further, and the danger is a spiralling cycle towards a crisis of expensive

electricity and a financially-unviable utility. This is, in effect, what we have been seeing play out with Eskom in recent years.

With the benefit of hindsight, the decision to build two of the largest coal-fired generators in the world now looks decidedly ill-considered. Eskom's build programme for Medupi and Kusile meant taking on large debt that needed to be funded via sharp increases in electricity tariffs made worse by massive blow-outs in their build budgets. Should these projects eventually be completed, they will enter service while there is once again excess supply. South Africa's economy has become less mining and industry-focused, energy efficiency has increased, and electricity intensity has substantially declined. The delinking of GDP from electricity demand is a trend underway in many other parts of the world as well.

Not all the fall-off in demand is about a weaker economy. Greater efficiency should be welcomed. The move towards a more sustainable energy future cannot happen unless energy efficiency and reductions in electricity demand are realised.

However, since electricity demand cannot reliably be forecast, it makes sense that the technology choices for generation should be revisited. Those technologies that can be built quickly, are modular, and do not need to be built on a large scale should be preferred. Incremental increases in supply that can be responsive to increases in demand are better than large, inflexible projects that (when they are eventually operating) produce sudden increases in capacity for which there is insufficient demand.

Long-term commitments to large inflexible technologies, such as coal and nuclear, mean we lose "upside optionality", or the ability to benefit from rapidly-falling costs and technology improvements in renewables and electricity storage. South Africa's history is a case study in the risks of being locked into redundant and risky large-scale infrastructure. We should not make the same mistakes again - there are better options and they are improving all the time. It is time that sensible energy planning decisions are taken in the best interests of the people.