

# Eskom: Are we missing the opportunity to learn from history?

It might come as a surprise to hear that the current problems with Eskom's power supply to the Cape are closely related to similar problems experienced in the late 1970s and early 1980s. What's even worse is that the causes of past problems were not adequately identified and have continued to contribute to Eskom investment problems and ultimately to the power failures in the Cape.

Planning the development of an integrated power system in the context of uncertain demand patterns is certainly no easy task. Most supply-side options have at least a two to four year lead time before they can come online, while (mostly neglected) demand management and smaller decentralised supply options require at least one to two years. However, simply put, Eskom's investment problems boil down to an inherent inability to come to terms with the nature of uncertainty about the future demands on its systems, and about the risks entailed in its technology and investment choices. In the past this has led either to supply shortages and interruptions, or to the enormously wasteful surplus capacity of the 1990s and early 2000s. Eskom simply has not been able to supply the right amount of power capacity since the late 1960.

After the 1973 oil crisis ESCOM (its name was changed to Eskom in 1987) continued to lower its already low prices. Predictably energy users switched to electricity as other fossil fuels became too expensive. Electricity demand levels soared higher than ever before. The utility was forced to rapidly increase plant orders and to increase prices 70% in real terms between 1974 and 1978. There was more to come.

With this effort Eskom managed to construct sufficient plant that should in principle have enabled it to meet demand. However, it totally underestimated the risks entailed in its technology strategy. The rapid up-scaling to larger unit sizes, operating at higher temperatures and pressures was unproven for use with South African coal. Eskom's new generation stations Arnot, Kriel and Matla experienced enormous operational difficulties, with boiler tube leaks and slagging problems, ultimately forcing the redesign of some of the boilers. As a consequence by 1981, Eskom had to resort to wide-spread load shedding despite having built new plant.

In response, Eskom embarked on an expansion programme that dwarfed all previous efforts. By 1983 Eskom had generation plant totalling 22 260 MW under construction or on order. This would effectively have doubled its total plant in commission. Following modest price reductions, it was forced again to raise prices in real terms. By 1984 the widespread protests (with headlines in the press such as "Stop the Rot") forced P W Botha to intervene by appointing the "De Villiers" Commission of Enquiry to review Eskom's operations and planning. Despite the fact that Botha's real objective was to remove Eskom's Chief Executive, the Commission produced an impressive technical analysis of Eskom's business planning.

In analyzing the rapidly developing surplus capacity problem, De Villiers identified problems related to incentives shaping managerial investment decisions, but unfortunately was not able to propose an effective remedy. In the end, only one station, Lekwe, was cancelled and only because Government refused to give permission for further borrowing to finance the station. Against all advice, including from its own Executive Director of Finance, Eskom continued with the construction of all six units of Majuba power station. As predicted Majuba was a bad investment and to this day generates some of Eskom's most expensive electricity. While this is not widely

appreciated, Eskom's surplus capacity problem cost the economy much more than the current power shortages.

It should not escape the attention that technological paradigms, construction choices and (lack) of demand-side strategies serve the pecuniary and reputational interests of engineers, managers and politicians, (often at the expense of society...) as much as they are supposed to serve the interests of society. Unfortunately the interests of these groups are often not adequately aligned with the social interest. In the past, managers have over invested in too risky mega power stations with new, unproven technologies because of the associated prestige and pecuniary benefits, rather than following more reliable incremental technology and investment strategies that can respond more effectively to unforeseen contingencies. Managers will benefit greatly from upside outcomes and can always avoid the downside risk by passing on the extra costs to consumers.

With the long period of surplus capacity since the late 1980s, Eskom managers had to pursue their fortunes elsewhere. Utilising Eskom's growing free cash flows, they ventured out with Eskom Enterprises, pursuing ill-fated telecoms and other ventures and driving the expensive and highly speculative Pebble Bed Modular Reactor project - an alliance between rent seeking engineers and misguided politicians. In the process they overlooked the reliability problem developing in the Cape since the mid 1990s and did not pay adequate attention to the mundane task of ensuring a reliable supply.

Why is it possible that this behaviour can go on unabatedly? Economists refer to this as a problem of information asymmetry. Eskom operates under unusual and unnecessary conditions of secrecy and thus has a monopoly on the information required to understand the implications of its investment and technology choices. Independent analysts and The National Energy Regulator of South Africa (NERSA) could in principle provide a valuable review of Eskom's plans, but Eskom Generation planners have consistently been able to bypass NERSA and obtain Cabinet approval for the plans without them being subject to independent critical review. No democratic accountability here.

In contrast to a monopoly utility, where only a hand full of backroom analysts develops investment plans, properly functioning markets benefit from numerous independent analysts scrutinising company investment strategies. While practical considerations might constrain the options for full-blown liberalisation in South Africa's Electricity Supply Industry, there is much that can be done to reduce the information problems that beset Eskom investment decisions making.

Eskom should be required to publish detailed information about its investment plans. Cabinet should use South Africa's investment in NERSA by requesting that it obtains public comment and provides an independent review of Eskom proposals. A much greater role for private sector participation is possible. Eskom should also be required to purchase power from any producer that is prepared to sell to it at a published avoided cost tariff.

If we want more value from our electricity industry, we will have to distil the lessons from history and be prepared to take the, sometimes difficult, decisions required to enable better outcomes.

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*This article is based on a research paper published today by the Graduate School of Business at the University of Cape Town and is available at [www.gsb.uct.ac/mir](http://www.gsb.uct.ac/mir)*