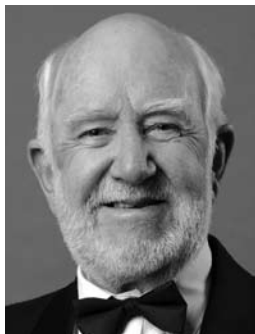


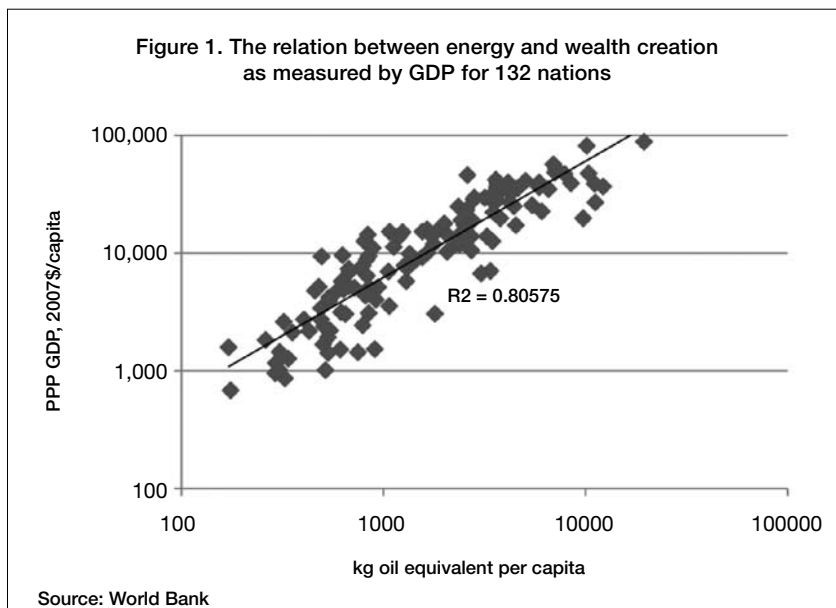
Restructuring South Africa's Electricity Supply Industry



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In recent years, South Africa's electricity supply industry has lurched from fiasco to disaster and back. In January 2012, Eskom held discussions with the Energy Intensive Users Group (EIUG) to persuade them to cut back on their demand for power. The alternative is to revert to rolling blackouts, which will drastically harm an economy already slowed by the lack of energy. How is this possible, in a country which less than a decade ago was seriously considering building a further aluminium smelter at Coega to provide an outlet for excess electricity?

There is a very direct relationship between wealth generation and the consumption of energy. The relationship is used by the International Energy Agency to predict future energy demand, which varies linearly with economic growth. Its predictions have proved astonishingly reliable for the past 20 years, an indication of the strength of the relationship, which is shown in Figure 1.



The wealthier a country, the more energy it consumes. The observation is also true – if energy supplies are limited, then growth will be constrained. This is precisely the situation in which South Africa now finds herself. Accordingly, we address the changes of the past fifteen years, in an attempt to identify the factors that have contributed to the change from an economy in energy surplus to one which is presently energy constrained, and considers the possible impact of proposals to remove the constraints.

The Historical Structure of Electricity Supply

Electricity supply in South Africa has long been the preserve of Eskom. Eskom was established in 1923 in terms of the Electricity Act (1922), following amalgamation of several private enterprises. It grew regionally in a number of 'undertakings', each with their own generating facilities. Distribution was primarily by municipalities, who bought power from their own local undertaking. The local undertakings constructed comparatively small power stations to service these local markets. The power stations were fuelled by coal, generally delivered by rail. There was comparatively little long-distance transmission of power. As a result many rural areas had no access to electricity.

From the late 1950s through the 1960s, the undertakings were interconnected by high-voltage transmission lines, until a national grid was established. It was thus possible to centralise the operations of the various undertakings. Also, Eskom found it possible to service many rural customers, so a diverse distribution system was established, with municipalities distributing power to the cities and Eskom servicing rural areas as well as transmitting power to the cities, and a few major industries whose demand for power was similar in size to that of a city.

Larger and more economic power stations were constructed close to the coal fields, because it was cheaper to transmit electricity by wire than to rail coal. This trend accelerated in the 1970s, when it was found possible to export high-grade coal very profitably. A by-product of the high-grade material was a low-grade fuel that formed an excellent and low-cost power station feed. The higher revenue generated by the new export business also enabled the coal mining industry to change its mining practice from underground to surface operations, which were much more efficient both in terms of the quantity of coal that could be recovered and the cost of production. Eskom was thus able to purchase large quantities of coal at a low price, both from the collieries producing export coal and from tied collieries that sold raw coal under long-term contract to Eskom.

The higher revenue generated by the new export business also enabled the coal mining industry to change its mining practice from underground to surface operations, which were much more efficient both in terms of the quantity of coal that could be recovered and the cost of production.

This in turn led to the construction on the Highveld of a fleet of large power stations fuelled by cheap coal. Typically these comprised six 600MWe units, each of which had its own boiler, generator and associated facilities, and were known colloquially as 'six-packs'. There were eight such stations, Kriel (1973), Duvha (1975), Matla (1977), Tutuka (1984), Lethabo (1985), Matimba (1986), Kendal (1987) and Majuba (1996) - the year is the start of the first unit.

This was an enormous programme and, as such, it demanded enormous resources. Eskom set up a huge engineering division to manage the construction. The demand for water for cooling was so large that it was necessary to divert rivers from one watershed to another. Because of water supply problems, Matimba was fully dry-cooled and Kendal was indirectly cooled. It was intended that Majuba should be dry cooled and the first three units were constructed accordingly. However, it became apparent, from the experience gained at Matimba that dry-cooling caused a serious and insuperable loss of efficiency, and the three final units at Majuba were conventionally cooled.

The programme had great momentum but, before completion, it became apparent that the growth in demand was slower than had been anticipated. This caused numerous problems, not least of which was the financing of the programme. Sales from the early stations were intended to help to finance the on-going construction. If sales fell below expectation, clearly there would be funding problems. This was exacerbated by civil unrest and attacks upon the primary transformers at the Arnot and Duvha stations which caused power cuts and additional loss of revenue.

As a result, the De Villiers Commission of Enquiry was established in May 1983. It reported in October that year, and recommended that ESCOM be replaced by a two-tier control structure, consisting of a management board and an Electricity Council of 15 members, namely:

- A chairman
- The Chief Executive of the Management Board of Eskom¹
- The Directors-General of the Departments of Finance, and of Minerals & Energy Affairs
- A nominee of the South African Transport Services
- Up to five independent experts
- One representative each from five major consumer organisations.

One of the first actions of the new Council was to slow down the build programme. The last station to commence construction was Majuba, where ground was broken in 1980. The project was put on hold, and only recommenced in 1992. Soon thereafter the Eskom engineering team was wound down and many of its staff transferred to Majuba to complete the station from site.

In addition many old, grate-fired stations were closed, and some of the more modern but small stations such as Camden and Grootvlei were mothballed (but have since been returned to service).

It was surprising that such excessive capacity was available, because from about 1982, 1920MW of power from the Cahora Bassa dam, which had come into service in 1979, was lost. The civil war in Mozambique led to the line to South Africa being damaged and made maintenance impossible. This had the knock-on effect that the agreement to supply

power to Mozambique was abandoned, which further increased the power available in South Africa. The line from Cahora Bassa only returned to full operation in 1998, and at the same time 450MW of power was routed through Swaziland to Mozambique.

In the early 1990s negotiations started to create a Southern African Power Pool (SAPP), an international high-voltage transmission grid which would also provide the benefit of making better use of South Africa's excess capacity. There were already links to Namibia, Botswana and Swaziland. The supply to Botswana was increased, and Botswana agreed to extend a line to Zimbabwe. Construction started in 1993. There were ambitions to extend the grid more widely, and to include the Democratic Republic of the Congo, where there was the possibility of constructing 40 000MW of generating capacity at Inga Falls on the Congo.

This structure was in place when the new South Africa came into being in 1994. Eskom owned and operated about 98% of the generating capacity in the Republic, was fully responsible for all high-voltage transmission, and was responsible for about half the distribution system. It had started to electrify a few black townships, but the majority of its domestic customers were white. There was a significant oversupply of electricity, but Eskom had recently concluded a contract with Alusaf for the provision of power to its Richard's Bay Hillside smelter, which commenced operation in 1995; and another with Mozal to power its Maputo smelter, about half the size of the Hillside smelter. Together these took a sizable fraction of the oversupply, but the terms of the contract were not particularly favourable to Eskom. As there was every appearance of political peace finally coming to the region electricity was becoming an increasing international commodity. The SAPP became a reality in 1995.

The Electrification Programme

The lack of electricity supply to black townships because of apartheid was one of the first issues to be addressed by the new government. Nevertheless, a National Electrification Conference was held in Johannesburg in September 1992, which led to the formation of a National Electrification Forum in 1993. Studies by the Forum revealed that distribution was a mess - many municipalities cross-subsidised services using electricity revenues, failed to collect revenues properly, and failed to maintain infrastructure. There

were “too many distributors and many were financially unviable” [McRae2006]. The Forum was wound up in early 1995, when it reported:

- There were two options to resolve the distribution problem. Either the smaller, non-viable municipal undertakings should be taken over by Eskom, or a few Regional Electricity Distributors (REDs) should be established, which would take over distribution from both Eskom and municipalities large and small; and
- A National Electricity Regulator (NER) should be established to regulate the electricity supply industry.

The second recommendation was implemented, and NER was established in terms of the amended Electricity Act of 1995. The first task of NER was to try to resolve which of the options should be followed. Fortunately the Act gave NER teeth, in the form of licences both to generate and to transmit or distribute electricity. Few of the then 420 municipalities distributing electricity seemed capable of meeting electrification goals while setting equitable and low cost tariffs and still remaining financially viable. So they were issued with temporary licences to warn them to address these issues.

... the threat of removal of temporary licences worked in a number of cases, where a lame municipality was about to lose supply because of non-payment, and a nearby, financially-sound municipality came to its rescue.

This was a holding solution, but it did not address the real problem of there being nearly 1000 different tariff structures in place across South Africa. There was even a difference between the price at which Eskom sold electricity to its own distribution network and what it charged municipalities. Nevertheless, the threat of removal of temporary licences worked in a number of cases, where a lame municipality was about to lose supply because of non-payment, and a nearby, financially-sound municipality came to its rescue.

Importantly, however, Eskom and the municipalities took on the task of electrification. In 1991, there were only about 80 000 new connections. At the peak of the programme, there were nearly 450 000 new connections a year. Today, nearly 10 million homes are connected to the grid, and less than 3 million remain to be connected, most of which are in rural areas. Every school and every clinic has power.

The programme has been fostered by the introduction in 2003 of free basic electricity. This had been announced with great fanfare in January 2000 by the Minister of Minerals and Energy, but it took several years to get the necessary legislation and financial arrangements in place. While the programme has been a great political success, it has also caused problems. Many of these were foreseen in studies preceding the Minister’s announcement. Worldwide, free energy had been found to be unsustainable in the long run, even in small quantities. Once the user has exhausted his/her allowance, the full tariff applies, which becomes a disincentive to the more widespread use of clean energy. 50kWh per month of free electricity is insufficient to provide more than the most basic services. Identifying those qualifying for the benefit is fraught with problems, while those who have no access to electricity are resentful of the perceived benefit from which they are debarred. It seems likely that in due course the unsustainable nature

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of the programme will be appreciated, and the more sustainable alternative of a steeply graded tariff introduced.

The success of the electrification programme has, however, to some extent taken the energy planners by surprise. Today about 6 million households use electricity for cooking. The installed generating capacity is ultimately determined by the peak

requirement, and the peak occurs in the early evening as the evening meal is prepared. Utilities cope with fluctuating demand by having large base-load generators that operate continuously at near-optimum efficiency; smaller generators that can follow most of the load changes without so much of an efficiency penalty for sub-optimal performance; and still smaller generators that can be started up and shut down rapidly to cope with peak demands. The peak power is accordingly the most expensive. The success of the electrification programme has meant that the provision of peak power has become critical, and additional turbine-driven generators have had to be installed at Ankerlig, Gourikwa, Port Rex and Acacia.

The 1998 White Paper on Energy

Section 7.1 of the White Paper dealt with the electricity supply industry, the longest section in the White Paper. We will attempt to summarise the key aspects as they relate to the ongoing development of the industry.

Policy Objectives

The White Paper set out two objectives relevant to this discussion:

- To enhance the efficiency and competitiveness of the South African economy by providing low-cost and high quality energy inputs to industrial, mining and other sectors; and
- To achieve environmental sustainability in both the short and long-term usage of our natural resources.

It hoped to achieve the first of these by:

- Giving customers the right to choose their electricity supplier;
- Introducing competition into the industry, especially the generation sector;
- Permitting open, non-discriminatory access to the transmission system; and
- Encouraging private sector participation in the industry.

Interestingly, the White Paper was effectively silent on the question of environmental sustainability.

Clearly, choice of electricity supplier would depend on successful introduction of competition. As this has not yet been achieved, the choice of supplier cannot be considered fruitfully here, but needs to be borne in mind as a longer term objective.

Introducing competition – Generation

The White Paper recognised that the first step towards introducing competition had to be the separation of Eskom's generation and transmission facilities. Both independent power producers and the co-generation of power would be encouraged, and the NER would be charged with establishing tariffs that would

reflect “full avoided costs of non-utility generation.” Eskom Generation would be established as a company and Eskom’s stations would be restructured as separate companies in their own right. However, the White Paper noted that any restructuring was “likely to be delayed for a number of years while the distribution sector restructuring [was] undertaken.”

Introducing competition – Transmission

The first steps towards liberalisation of transmission had already been taken – Eskom’s transmission licence from the NER had an “open access” condition. Government undertook to “legislate for transmission lines to provide for non-discriminatory open access to uncommitted capacity, transparency of tariffs, and disclosure of cost and pricing information to the National Electricity Regulator.”

Introducing competition – Distribution

The White Paper summarised the key problems in the distribution of electricity as follows:

- “There are substantial differences in the financial health of municipal distributors. Four municipalities earn 50 per cent of the total surpluses being earned by all municipal distributors and an additional 18 municipalities earn another 25 per cent of the total surpluses. At the other extreme 289 municipalities earn less than 1 per cent of the total surpluses, and the bottom 25 per cent of municipal distributors loses money on their electricity sales.”
- “There is a wide disparity in the prices paid by the various customer segments that cannot be fully explained by the costs associated with serving these segments. For example, mining customers pay anywhere from 9 to 17 cents per kWh in Gauteng, and anywhere from 23 to 32 cents per kWh in Mpumalanga. Price disparities for other customer segments are as wide.”

The REDs would establish cost-reflective tariffs for each major customer segment, and the NER would regulate domestic electricity prices in order to rationalise the large variety of tariffs.

The White Paper proposed to resolve these by consolidating the electricity distribution industry into five financially viable independent Regional Electricity Distributors (REDs). The REDs would be owned by Government, and all distribution network assets would pass to them. The REDs would either be companies or statutory corporations.

The pricing complexity would be addressed via the National Electricity Regulator in a number of ways. Cost-reflective tariffs would apply at electricity distributor supply points². The REDs would establish cost-reflective tariffs for each major customer segment, and the NER would regulate domestic electricity prices in order to rationalise the large variety of tariffs.

Matching Supply and Demand

The White Paper noted the difficulties that had been caused by an oversupply. However, it also noted that “Eskom’s present generation capacity surplus will be fully utilised by about 2007. ... The next decision on supply-side investments will probably have to be taken by the end of 1999 to ensure that the electricity needs of the next decade are met.” In the hopes of obviating future problems, Government would “require the use of integrated resource planning methodologies in evaluating further electricity supply investments.”

Implementation of the White Paper

The NER seized upon the opportunity offered by the policy objective to provide low-cost and high quality energy inputs. About the quality it could do little except monitor what Eskom was doing, but pricing was clearly well within its remit. In the early 2000s it took up the fight against inflation, and reduced Eskom's applications for annual tariff increases to significantly below the rate of inflation. At the end of the 20th century, the cost of Eskom power was the lowest in the world; by 2005 it had become even cheaper. With hindsight, this was a disaster. Eskom was unable to finance essential base load expansions; commerce, industry and households had no economic incentive to save energy; and manufacturers lived in a fool's paradise, easily able to compete on world markets because their input costs for energy were so low by world standards.

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Relatively unrestrained growth in demand and very limited increases in supply had the inevitable consequences – as predicted in the White Paper. The country essentially ran out of adequate power in 2007. When 900MW of generation capacity was lost at the Koeberg nuclear power station, there were widespread blackouts, a clear indication of how tight the supply had become. Moreover, the incident put unaccustomed stress on the transmission system, which experienced a far higher than normal failure rate. Less than a year later, in January 2008, a combination of unusually heavy rains on the Highveld, low coal stocks at the stations, and a heavy maintenance schedule at the power stations caused the entire system to collapse, with enormous economic damage.

It also damaged our relationships with our partners in the SAPP. One of the worst affected was Botswana, which had only 120MW of own generation and imported 500MW from South Africa. Loss of the South African supply was an economic disaster, which was exacerbated by the South African refusal to conclude an off take agreement with the intended 3600MW Mmamabula station. Botswana had hoped that construction would be well advanced by 2008, but the National Energy Regulator of South Africa (NERSA)³ believed the price sought for electricity was excessive. As a result, not only was South Africa not able to benefit from a possible additional source of supply, but Botswana was denied the opportunity of becoming energy independent.

In 2001, Eskom's name was changed to Eskom Holdings Limited, and it became a wholly-state-owned enterprise administered by the Department of Public Enterprises. This was the first step foreseen in the introduction of competition into the generation and transmission parts of the supply industry.

The change was not an unqualified success. For one thing, the Department was ill-equipped to deal with the challenges of running one of the largest public utilities in the world. The Electricity Council was abandoned – it had provided high-level oversight through some players who had had a lifetime of experience in the industry, and that experience was lost. Board appointments became a political handout, and a number of singularly ill-advised appointments were made, which has led to difficulties in the strategic direction of Eskom at a time when it desperately needed direction. In one tragi-comic incident, the Chairman of the

Board, who had recently been appointed after a life at senior management level in industry, accepted the resignation of the CEO, and the CEO then withdrew his resignation, apparently after political pressure on him. This led to the loss of both officers and the resignation of another board member.

The introduction of competition did not proceed as hoped. In vain the Department called for private enterprise to enter the supply. There was a simple and unrecognised stumbling block – who can possibly compete with the lowest-cost producer in the world? The answer is, of course, no-one. The price of electricity had to rise to levels commensurate with that in the rest of the world before private industry could commit funds towards new generation and expect a reasonable return on investment.

In the interim, there was no decision to proceed with supply-side investment, which the White Paper had said should be made in 1999. The new Eskom board had not worked out how to access the major funding required for such an investment, and government was set on trying to establish public-private ventures which never materialised. The then Department of Minerals and Energy issued numerous warnings that went unheeded. The result was predictable and, as we have seen, disastrous.

In November 2003, environmental issues finally entered the supply question ... This set a target of 10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro.

In 2004 the first Retail Electricity Distributor⁴ was set up in Cape Town. In September 2005, Cabinet announced that six Metro REDs would be established immediately after the 2006 local government elections, and that all assets and distribution personnel would be transferred from Eskom to the REDs at the end of June 2006. This process was halted. The City of Cape Town threatened to mount a challenge in the Constitutional Court over the compulsory transfer of its assets to RED1. In December 2010, Cabinet decided to close Electricity Distribution Industry Holdings, a company established to manage distribution in the areas which were not serviced by the metropolitan REDs.

In November 2003, environmental issues finally entered the supply question, with the publication of a White Paper on Renewable Energy. This set a target of 10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro.

In 2005, the decision was finally taken to commence construction of the next coal-fired base-load power station, Medupi. Construction started in 2007, and it is expected that the first unit will commence operation in late 2013, over a year behind the original schedule. Delays are attributed in part to the supply of the boilers. The company Hitachi was awarded the contract for the boilers, which controversially coincided with the ANC's Chancellor House organisation taking up 25% of the local subsidiary of Hitachi which is undertaking construction of the boilers.

The construction of a further base-load station, Kusile, started in 2008. The first unit is expected on line in 2014. There is concern about the costs of both these stations, as the investment per installed kW is approximately double the international benchmark.

In terms of the Electricity Regulation Act, No. 4 of 2006, NERSA finally approved significant increases in Eskom's tariffs in 2008. It allowed about a 25% increase in the price every year for three years, which has had the effect of raising the cost of power to internationally comparable levels. NERSA also published Renewable Energy Feed-in Tariffs (REFIT) in 2009 which were, with hindsight, quite generous. The question then arose as to who would pay for the difference between the standard tariff and the REFIT? However, no power purchase agreements were concluded in terms of the 2009 REFIT. When the REFITs were revised in 2011, with decreases of as much as 40%, there was considerable distress in some quarters. However, this did not prevent an excess of offers of renewable energy in terms of the bidding resulting from the Integrated Resource Plan of 2010 (IRP2010) as discussed below. There is a lack of clarity about the REFITs – the IRP2010 process involved competitive bidding, but details of the bidding process and whether they include REFITs are unknown.

With regards to access to the grid, Eskom and NERSA have also agreed rules under which any Independent Power Producer (IPP) can be allowed access to the grid in an area serviced by Eskom⁵. The process starts with an application to NERSA. Once this is approved, the IPP applies to Eskom, and Eskom supplies a non-binding cost estimate for the connection. If this is accepted, Eskom will then prepare a budget quote. If the IPP wishes to proceed, a connection, use-of-system agreement and an operating agreement must be signed between the IPP and Eskom before Eskom will allow the IPP to connect to the grid.

The National Energy Act, No. 34 of 2008, put into effect a number of issues from the White Paper on Energy that had thus far not been addressed. In particular, it set the process by which integrated resource planning for energy would be undertaken. We will therefore briefly look at the impact of IRP2010 on the restructuring of the supply industry before looking to the way forward in the light of what has so far occurred.

IRP2010

The process started with the publication of a draft plan in January 2010. After a round of public consultation, a revised draft plan was published for public comment in October 2010. The plan foresaw:

- The continuation of Eskom's committed build programme including the return to service of Grootvlei and Komati power stations, the construction of Medupi (4332 MW) and Kusile (4338 MW) power stations and the Ingula (1332 MW) pumped storage scheme.
- The construction of the Sere 100 MW wind farm.
- Phase 1 of the Renewable Energy power purchase programme in terms of the REFIT1 programme amounting to 1025 MW.
- Phase 1 of the Medium Term Power Purchase programme of 390 MW.
- The Open Cycle Gas Turbine (OCGT) Independent Power Producer (IPP) programme of 1020 MW.
- A nuclear fleet contributing at least 9.6 GW by 2030.
- A wind programme in addition to the REFIT1 wind capacity of a minimum 3.8 GW.
- A solar programme in addition to the REFIT1 solar capacity of a minimum 400 MW.
- A renewable programme from 2020, incorporating all renewable options of an additional 7.2 GW.
- Imported hydro options from the region totalling 3349 MW from 2020 to 2023.
- CCGT capacity, fuelled with imported LNG, totalling 1896 MW from 2019 to 2021.
- Own generation or co-generation options of 1253 MW.
- Up to 5 GW of generic coal-based power generation from 2027 to 2030.

These proposals had arisen from modelling what was needed to achieve the anticipated demand, subject to certain constraints. One of the primary constraints was the carbon emission profile derived from the Department of Environment Affairs' Long-Term Mitigation Scenarios (LTMS). This was the subject of a degree of criticism of the plan, because it was a set of scenarios which, by their very nature, took extreme positions in order to define the range of options within which future plans should be structured. There was also criticism of the continuation of a nuclear component in the Plan, and the lack of assessment of the impact of interruptible sources on the grid. In general, however, there was a high degree of acceptance of the Plan.

The Revised Balanced Scenario that emerged was the subject of final refinement before being approved by Cabinet in March 2011. Nuclear remained in the

plan; the renewables programme was brought forward in order to foster local industry; and an emission constraint of 275 million tons of CO₂ per annum was confirmed. The plan called for 1 850 MW of onshore wind, 1 450 MW of solar photovoltaic capacity, 200 MW of concentrated solar power, 75 MW of small hydro capacity, 25 MW of landfill gas and 12.5 MW of biomass and biogas respectively.

The Department of Energy (DoE) solicited renewable energy bids in July 2011. There were complaints about the conditions attached to the bids, but it is difficult to tell how justified these complaints were as the conditions have not been published. Nevertheless, 53 bids were made, worth a total of R70-billion and represented 2 100 megawatts of electricity, 50% from wind, 48% from solar and 2% from hydro sources.

In November 2011, the DoE announced acceptance of 28 bids with a total 1 416 MW being selected as preferred bidders. These comprised solar photovoltaics (631.53 MW), concentrated solar power (150 MW) and wind (633.99 MW)⁶. The preferred bidders are required to meet financial closure by 30th June 2012 and to commence construction shortly after that. A second bid window will close in March 2012 and will be followed by three subsequent rounds. A separate procurement process for small renewable energy IPP projects, involving a total capacity of 100 MW, will start in early 2012.

Cogeneration, nuclear power and renewable energy will all feature strongly in South Africa's energy future. Prices will probably rise modestly from now onwards, but the generation side of the industry will look very different in 20 years time.

As this article was being completed, the Department of Energy announced that, during the 2012 session of Parliament, it intended to put forward legislation to create an Independent System and Market Operator. This would take over the transmission and distribution of electricity from Eskom, and would enter into purchase agreements with generators and supply agreements with municipalities in terms of which a rationalised tariff structure would prevail. A draft bill was published for comment in May 2011. It is understood that there was considerable opposition to the Department's proposals, so the intended structure is not clear at present.

The Way Forward

As we have seen, the restructuring of the generation aspects of the electricity supply industry is well advanced. Cogeneration, nuclear power and renewable energy will all feature strongly in South Africa's energy future. Prices will probably rise modestly from now onwards, but the generation side of the industry will look very different in 20 years time.

Most of the aspects required to free up the transmission aspects of the industry are in place. There is a debate regarding the precise position of a single network operator, and how it should evolve out of Eskom, but in principle the way forward is clear, although the financial implications are still somewhat hazy. Clarity can only come through implementation, and that will occur as more IPPs enter the supply chain.

Distribution remains chaotic. There are areas of reasonable performance: Eskom and the major metropolises are generally meeting standards, although there are

some major questions about Johannesburg's City Power. There remain many areas where reform is critical to the maintenance of supply. It is disconcerting that a nation that can accomplish electrification at the rate which we have achieved still cannot resolve the distribution equation satisfactorily. However, it seems entirely possible that the funds that have been devoted to electrification over the past 15 years could soon be diverted to resolving the difficulties of the distribution side of the industry.

A question which has not been addressed is that of our relations with our neighbours. The catastrophe of early 2008 has clearly damaged our relationships with them. The SAPP is administered out of Harare, and it is not clear to what extent the national dysfunction of Zimbabwe is affecting its performance. Nevertheless, ambitions in Namibia, Botswana and Mozambique will undoubtedly enhance the supply industry of the region over the next 20 years, and we can learn from Europe's experience, that the introduction of renewable energy is fostered by extensive interconnection. As government gains confidence and competence in governing, it is to be hoped that statesmanship will be enhanced and the Power Pool will become a stronger feature in the supply.

NOTES

- 1 The organisation was known as Eskom/Evkom until 1984 when the name was formally changed to Eskom.
- 2 At the time Eskom levied a transmission surcharge of up to 3%, although the actual costs of long-distance transmission were significantly higher. Also the basis for the surcharge varied from customer to customer.
- 3 The National Electricity Regulator became the National Energy Regulator (NERSA) in terms of the National Energy Regulator Act, 2004. Its mandate is to undertake the functions of the Gas Regulator, the Petroleum Pipelines Regulatory Authority and the National Electricity Regulator.
- 4 The name was changed from 'Regional' to 'Retail' when the decision was taken to organise the major metropolitan areas as distribution areas and have a national agency catering for distribution for all areas not serviced by the metropolitan areas. See http://www.dpe.gov.za/state-4_eskom (accessed Jan.2012)
- 5 <http://www.eskom.co.za/c/article/150/independent-power-producers-ipp/> Accessed January 2012
- 6 http://www.energy.gov.za/files/media/pr/2011/MediaStatement_IPP_07Dec2011.pdf Accessed December 2011

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