

‘Harnessing the Falls’: Early South African Electrification and the Victoria Falls and Transvaal Power Company, 1906 – 1948

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Abstract

The Victoria Falls and Transvaal Power Company (VFP) was the largest generator of electricity in South Africa between 1906 and 1948. This made the VFP an extremely important driving force in the country’s economy, especially as the Rand’s mines began to rely on increasing electrical consumption as part of their mechanisation. In turn, it was this economic importance that brought the VFP into conflict with other groups that were attempting to establish their own electricity generation and distribution grids, especially so with the Rand’s municipal bodies. After the enactment of the Electricity Act of 1922, the VFP was faced with further opposition in the form of the Electricity Supply Commission (hereafter referred to by its contemporary name, Eskom). While the relationships between the VFP, Eskom, and the Rand’s municipalities has been examined in the existing body of published literature, the focus of these prior analyses has largely been centred on Marxist frameworks. Instead, this article intends to examine these relationships in terms of the complex relationships between the VFP, municipal governments, local government, and their electricity consumers.

Keywords: Eskom; Victoria Falls and Transvaal Power Company (VFP); South African Electrification.

Opsomming

Die Victoria Falls and Transvaal Power Company (VFP) was tussen 1906 en 1948 die grootste kragopwekker in Suid-Afrika. Dit het die VFP 'n uiters belangrike dryfkrag in die land se ekonomie gemaak, veral omdat die myne op die Rand toenemend op elektriese verbruik begin staatmaak het as deel van hulle meganisasie. Juis hierdie ekonomiese belangrikheid het die VFP egter in konflik gebring met ander groepe,

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veral munisipaliteite aan die Rand, wat probeer het om hulle eie elektrisiteitsopwekkings- en verspreidingsnetwerke te vestig. Met die inwerkingtreding van die Elektrisiteitswet van 1922 het die VFP verdere teenkanting ondervind in die vorm van die Elektrisiteitsvoorsieningskommissie (Eskom). Terwyl die verhoudinge tussen die VFP, Eskom en die Randse munisipaliteite reeds in die bestaande gepubliseerde literatuur ondersoek is, het die fokus van hierdie vorige ontledings grootliks binne 'n Marxistiese raamwerk plaasgevind. Hierdie artikel beoog egter om hierdie verhoudinge binne die konteks van die komplekse interaksies tussen die VFP, munisipale regerings, plaaslike owerhede en elektrisiteitsverbruikers te ondersoek.

Sleutelwoorde: Eskom; Victoria Falls and Transvaal Power Company (VFP); Suid-Afrikaanse elektrifisering.

Introduction

Electrification and associated technologies added extra momentum to the already vigorous growth of mining activity on the Witwatersrand at the turn of the twentieth century, and the Victoria Falls and Transvaal Power Company (VFP) played an important role in providing this electricity between 1906 and 1948. Within two decades of its founding, the VFP was generating more electricity 'than was consumed in the cities of London, Birmingham and Sheffield combined,' largely due to the Company's sales to the Rand's mines.¹

Founded in 1906, the VFP was a subsidiary of the African Concessions Syndicate (ACS), which was itself a subsidiary of the British South Africa Company (BSAC). The Company was formed with the original intention of generating hydroelectric power on the Zambezi River to supply electricity to the Rand's mines, roughly 1 100 kilometres to the south. The scheme was highly impractical, given the large transmission losses that would have occurred on such long high-voltage power lines; the extreme costs of transmitting power over such distances; and the regular decrease in electricity generation that would occur during the annual dry season.²

The story of the VFP's politics and economics is a tangled, overlapping network of international deals that were made to secure generating equipment, expertise, and capital from a variety of sources across South Africa and Europe amidst increasing nationalist tensions in the period prior to World War I. Aside from these

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1. R. Christie, *Electricity, Industry and Class in South Africa* (London: Macmillan, 1984), 6.
 2. Christie, *Electricity, Industry and Class*, 6; S.R. Conradie and L.J.M. Messerschmidt, *A Symphony of Power: The Eskom Story* (Johannesburg: Chris van Rensburg Publications, 2000); University of Cape Town, Special Collections (hereafter UCT), BC697, A15.3, 'Rand Power: Problems Generated Some Notable Achievements'.

international networks, it is also important to understand the VFP's contribution to the formation of the National Grid – the Company's electricity network was entirely regional, but the purchase of the VFP's assets by Eskom in 1948 increased the parastatal's national capacity by almost a third. When the Electricity Act was signed in 1922, Eskom was charged with providing electricity that was both cheap and abundant; however, as the early annual reports acknowledged, the parastatal was not responsible for beginning the process of electrification, since other entities, such as local municipalities and some of the larger gold mines, had already established their own generation and distribution grids. In order to construct the National Grid, Eskom would therefore have to negotiate agreements and contracts with the owners of these other systems, whether to appropriate existing infrastructure or to begin anew with establishing local and regional grids.

As an important part of the process of electrification in South Africa, the VFP has been well discussed by scholars such as Renfrew Christie and Nancy Clark, as well as in Eskom's semi-official publication *A Symphony of Power: The Eskom Story*.³ Christie and Clark made valuable contributions in scholarly understandings of the relationships between the parastatals, the South African state's ongoing attempts to remake the country's economy on an industrial basis, and the relationship between capital and industrialisation before and after 1948. So significant is Christie's contribution in particular, that other authors have used *Electricity, Industry and Class in South Africa* as their most prominent source when discussing the Victoria Falls Company.⁴ While this is testament to the quality of Christie's scholarly output, it also means that researchers investigating the VFP have relatively few secondary sources to utilise.

Conradie and Messerschmidt's writing on the VFP is less critical of the Company than either Christie or Clark, but is an important source of information on how the VFP's generation and distribution systems were integrated into an increasingly nationalised system after the Electricity Act of 1922. Christie and Clark were certainly correct in linking national economic and racial policies with industrialisation. However, many of the arguments used against the VFP by local and national political groups place larger emphasis on whether a privately-owned company should be allowed to generate and distribute electrical power to consumers who could be supplied from municipally and nationally owned grids. It is the aim of the following sections in this article to add to prior analyses of the history of the VFP by examining these local and national arguments.

3. Christie, *Electricity, Industry and Class*; N.L. Clark, *Manufacturing Apartheid: State Corporations in South Africa* (New Haven, CT: Yale University Press, 1994); Conradie and Messerschmidt, *Symphony of Power*, 28-100.

4. See, for instance, B. Freund, *Twentieth-Century South Africa: A Developmental History* (Cambridge: Cambridge University Press, 2019), 32; L. Gentle, 'Eskom to Eskom: From Racial Keynesian Capitalism to Neo-Liberalism (1910-1994)', in *Electric Capitalism: Recolonising African on the Power Grid*, ed. D. McDonald (Cape Town: HSRC Press, 2009), 54-59; and A. Marquard, 'The Origins and Development of South African Energy Policy' (PhD thesis, University of Cape Town, 2006), 150-151.

‘A Six Million Scheme’: Starting the Victoria Falls (and Transvaal) Power Company, 1906 – 1922

As Renfrew Christie has noted, the Rand of the early twentieth century was proving to be an ideal testing ground for the theory of centralised electricity generation and distribution. Before the start of the South African War (1899-1902), electrification in the Transvaal had not progressed much further than streetlighting in urban areas, and many of the mining companies preferred the use of steam engines to run machinery. By the eve of the First World War, the Witwatersrand’s gold mines were the largest consumers of electricity in the country, and each of the largest gold mines demanded more electricity than the entire country’s coal mining industry. These differences in energy requirements may be attributed to the variables in the working conditions in gold and coal mines, such as the type of rock in which the raw materials are found.⁵

In October 1906, the VFP had requested permission to build a power station on the East Rand. The municipalities of Johannesburg and Boksburg objected to this application, on the grounds that municipalities should be granted priority of supply within their areas.⁶ The exact role that these objections played in the government’s decision to reject the application is unclear, but the official rationale was that the Rand Central Electric Works Limited (RCEW) had filed a protest against the VFP’s operations on the East Rand. The RCEW stated that the VFP was not directly involved in mining operations and did not have the legal rights to construct or operate public services within the area.⁷

The Company had encountered the first critical problem in supplying electricity to the Rand – competition from the individuals, companies, and government groups that had already established their hold on resources and areas of supply. The VFP’s solution to this was relatively efficient and simple. They engaged in a series of negotiations, payments, and buy-outs that cost the Company dearly in short-term financial terms but ensured a dominant role in the long-term supply of electricity to the major gold mines until after World War II. Within six months of the East Rand application being rejected, the VFP had bought the assets and supply licenses owned by the RCEW and the General Electric Power Company for a combined total of £500 000. These two purchases made the VFP the single largest, and almost exclusive, provider of electricity to the Transvaal’s gold mines.⁸

5. Christie, *Electricity, Industry and Class*, 21.

6. ‘Cheap Power’, *Transvaal Leader*, 11 July 1906.

7. ‘Rand Power Scheme’, *Transvaal Leader*, 4 November 1906.

8. Christie, *Electricity, Industry and Class*, 32; Clark, *Manufacturing Apartheid*, 26.

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When problems arose with Johannesburg's power supply after the failure of the gas-powered municipal power plant, the city made an emergency agreement with the RCEW in March 1906 to provide supplies of electricity to municipal customers. Once the RCEW was integrated into the VFP's business holdings, the VFP took over the responsibility for the emergency bulk supply to the city until 30 June 1908.⁹ This contract gave the Company the opportunity to consolidate its hold on the supply of power on the Rand, but also gave the city a convenient scapegoat when the chronic problems at the Johannesburg Lighting Department caused the department to suffer a large financial loss between 1907 and 1908. The town council announced that the city was facing an increasingly large deficit in the lighting budget, and promptly blamed the VFP for causing the situation.¹⁰ The contract between the Company and the city expired in June 1908, but the municipality opted to wait for the municipal power plant to be repaired rather than allowing the VFP to continue supplying ratepayers with electricity.

The Company made further gains in creating a monopoly over electricity generation when the Rand Mines Power Supply Company Limited (RMPS) was formed as a subsidiary of the VFP to supply electricity and compressed air to the Rand Mines Limited Group.¹¹ Until the VFP subsumed the RMPS in 1924, they were considered to be separate legal entities.¹² The VFP was registered as a company in Southern Rhodesia, but its operations were governed by Rhodesian, South African, and British legislation. The RMPS, on the other hand, was registered in South Africa and was subject only to South African law.¹³ The legal wrangling that was necessary to coordinate the activity of two legal entities that owned property, employed staff, and conducted business across three countries was largely down to the payment of taxes – any tax incurred by the VFP would be paid to the country in which the Company was registered. By registering the VFP in Southern Rhodesia, the Company ensured that taxes were funnelled back to the BSAC, while also avoiding the need to pay the higher tax rates imposed in the Transvaal.¹⁴

Even before the RMPS had started supplying power, engineers had already calculated that the combined capacity of the VFP and RMPS would exceed that of London's metropolitan area. The system of amalgamating companies and establishing subsidiaries makes it easier to understand why a town councillor from Ophirton told the Power Companies Commission in 1909 that the VFP wanted 'to have the run of Johannesburg, then of the Transvaal, next of the world, and finally of

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9. J.R. Shorten, *The Johannesburg Saga* (Johannesburg: John R. Shorten, 1979), 609.
 10. 'Municipal Electric Supply', *Transvaal Leader*, 21 March 1908.
 11. UCT, BC697, A15.2, 'Compressed Air Supply on the Rand'; Christie, *Electricity, Industry and Class*, 32.
 12. UCT, BC697, A15.2, 'Souvenir of the Visit to the Rosherville Generating Station'.
 13. UCT, BC697, A15.1, 'V.F.P. Handbook'.
 14. Christie, *Electricity, Industry and Class*, 36.

Heaven itself.¹⁵ This might be an overstatement of the VFP's aims, but it is reflective of the tensions between the VFP and local government.

Primarily, the objections raised by politicians outside of the greater Johannesburg area related to the use of land by private electricity companies. Farmers in the Transvaal were concerned that private power companies would not need permission to obtain way leaves for running high-voltage power lines across farmland and that power companies would want access to coal reserves found on agricultural land. The coal industry itself was worried that centralised electricity generation would affect their returns on mining investment and that the railways would lose revenue if coal was sent to the Transvaal instead of being transported across the country. Objections to the VFP were also brought before the Power Companies Commission by the Transvaal Institute of Mechanical Engineers, who were specifically opposed to the continued contracts between the VFP and the German equipment manufacturer, Allgemeine Elektrizitäts Gesellschaft (AEG).¹⁶ This had been a point of contention between the VFP and various groups since the Company's founding in 1906, although these objections were raised sporadically.¹⁷ After listening to the opposing arguments brought by the engineers, the Commission decided that there would be no need to force the VFP to only purchase British-made equipment. This was because, as stated by Christie, the Power Companies Commission believed that 'the AEG would have won the contract on open tender', making it unnecessary to enforce a policy of exclusively purchasing British machinery.¹⁸ The Company also managed to deflect a portion of the anti-German criticism by employing British managers, advisors, and engineers to operate the Company's undertakings. Most prominent amongst these was the VFP's General Manager, Bernard Price.¹⁹

The Witbank Colliery's consulting mechanical engineer suggested to the Power Companies Commission that coal should be mined and transported long distances via rail and that the Rand's mines should be encouraged to invest in hydroelectric power along the Crocodile River. The VFP's argument for the privatised electricity generation rested on the idea that a large company would be better suited to generating and transmitting electricity over longer distances, while smaller intermediaries would then be allowed to distribute electricity to consumers within a specified area.

The Transvaal's parliament had already drafted a bill to regulate the supply of electricity in the colony before the Power Companies Commission had begun its hearings in 1909, but this draft was put on hold until the Commission's official report

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15. 'Electric Power Schemes: Strong Opposition', *Transvaal Leader*, 28 May 1909.
 16. Christie, *Electricity, Industry and Class*, 45.
 17. Christie, *Electricity, Industry and Class*, 30-32.
 18. Christie, *Electricity, Industry and Class*, 45.
 19. Christie, *Electricity, Industry and Class*, 38; 45.

could offer recommendations on further legislation. When the Power Bill was finally presented to the colonial parliament in April 1910, responses were largely determined by loyalty to either municipal suppliers or the VFP. For those loyal to the municipality, the Power Bill was nothing but a ruse to hide the VFP's attempts at establishing a monopoly in the Transvaal – a 'Power Plot' that threatened the city's established right to supply services.²⁰ For ratepayers who felt marginalised by the city's lack of service delivery in their areas, the Power Bill offered an opportunity to frighten the city fathers into improving services. A municipal ratepayer complained that he had only been contacted by the city about receiving electricity after their customer base had been threatened by the impending Power Bill.²¹

The Power Companies Commission reported to the Transvaal government that large and centralised generating stations would be more cost-effective in the longer-term than a network comprised of small, isolated stations that each covered their own area, adding that '...undertakings of this nature should be left to private enterprise.' Municipal ratepayers, according to the Commission, would be better off if their municipalities refrained from investing large sums of money in establishing new powers stations, since technological changes could make even the newest machinery redundant.²²

Witbank's Coal and Johannesburg's Gold: The VFP after the 1922 Electricity Act, 1922 – 1948

When the national government enacted the Electricity Bill during the second half of 1922, the VFP's undertakings took on national importance. As the largest supplier of electricity to the Rand's mines, the Company had been important to the Union's economy after 1910, but the VFP was now going to be involved in the electrification of all four provinces. While the Company had worked for the previous two decades to secure their customer base on the Witwatersrand, Eskom also wanted the coal mines in the Witbank area to have access to a cheap supply of electricity. Witbank presented an ideal site for the construction of a large power station to supply the Rand's mines because the region had a combination of fuel supply from the coal mines; water from the nearby Olifants River; and relative proximity to the Rand, thereby making high-voltage transmission lines possible.

20. 'The Power Plot: City in Danger', *Rand Daily Mail*, 16 April 1910; 'The Power Plot: Rousing the People', *Rand Daily Mail*, 18 April 1910; 'The Power Plot: Pretoria's Disapproval', *Rand Daily Mail*, 23 April 1910; 'Power Plot: Great Meeting of Citizens', *Rand Daily Mail*, 19 April 1910.

21. 'Letters to the Editor: Power Bill – First Result', *Transvaal Leader*, 12 May 1910.

22. National Archives of South Africa (hereafter NA), Pretoria (Transvaal Archive Depot, hereafter TAB), CT, 155, T39/56, 'Report of the Power Companies Commission'.

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Shortly after being established in March 1923, Eskom had started to investigate whether it would be feasible to construct a new power station in Witbank, but their inquiries were somewhat truncated by the VFP's application for a license to build their own station and to provide electricity to the Rand and Witbank areas in May 1923. The Company had already been granted a license soon after the signing of the Transvaal Power Act, but the license had lapsed when the Electricity Act was passed in 1922.

The Company believed that establishing a power station at Witbank would be preferable to adding extra capacity to their pre-existing station at Vereeniging. In January of 1923, VFP General Manager Bernard Price wrote to the Electricity Control Board (ECB) to justify the Company's position. Price stated that the 'Gold Mining Industry is a wasting industry and must sooner or later fall away.' He went on to state that it would be in the best interests of the VFP and the Railways Administration for the Company to assist in the electrification of the railways and the growing industries in Witbank.²³ Price was forced to retract his offer of cooperation between the VFP and Eskom two months after writing to the ECB, because the Company's directors in London felt that there was insufficient time to negotiate with the South African government before the mines required extra power. Eskom believed that this meant that the VFP had reconsidered the construction of a station in Witbank, but the Company had decided instead to proceed with their plans for Witbank without government assistance.²⁴

On 11 May 1923, the ECB received notification from the VFP that it wished to apply for a license to establish a new power station at Witbank, with formal objections from the Railways Administration and Eskom being lodged during June 1923. The VFP was concerned that future demand on the Rand would outstrip the available capacity in local power stations, since the Company had only two spare generator sets that could be used to supply peak load. Engineers predicted that by June 1924, the Company would only have a single surplus generator set that could be used to supply electricity during peak hours.²⁵ The ECB was required to convene a hearing on the license application, since objections were received from Eskom; the South African Railways & Harbours Administration (SAR&H); Government Goldmining Areas, Limited; several mining houses, and the Johannesburg municipality. The mining houses objected to the VFP's application on the basis that the Company had not supplied all of the information that was required by the Electricity Act of 1922. The Act specified that all license applications had to provide estimates of tariffs, minimum monthly consumption quotas, the classes of

23. NA, Pretoria (Central Archives Depot, hereafter SAB), ECB, 10, 56/8/1, 'Bernard Price to Robert Kotze, 26 January 1923'.

24. NA, SAB, PM, 1/2/56, 15/6, 'The Application of the Victoria Falls and Transvaal Power Company and its Relation to the Future Power Supply in the Transvaal'.

25. NA, SAB, MNW, 634, MM2879/22, 'Sixteenth Meeting'.

consumers that were expected to use generated power, and the cost price of generating electricity at the new station.²⁶ Most of the complaints from the mining houses were withdrawn during the later stages of the ECB's hearings on the application, after the VFP agreed to offer better tariffs and rebates to the mines once operating costs decreased and the Witbank station was fully operational.²⁷ Eskom withdrew its objections in exchange for guarantees that all consumers who bought power directly from the Witbank station would be offered rebates on their purchases.

The Electricity Act of 1922 stated that in cases where an undertaking made a 'surplus' profit in the course of a financial year, all customers were to be granted pro-rata rebates equivalent to 25 percent of the profit. The VFP's agreement with Eskom was that all customers receiving power from the Witbank station would be granted a rebate to the value of 50 percent of annual profits accrued from the Witbank undertaking. In addition to this, the Company agreed to give all mining consumers a discount of 15 percent, which would be applied retroactively from 1 January 1923. This discount would then increase by an extra 2½ percent once the station was in full commercial operation.²⁸

The Mayor of Johannesburg voiced his objections to the ECB's decision that allowed the Company to consult with its head offices in London on a provisional license agreement without first consulting the City Council of Johannesburg. The municipality claimed that their application for an extension to the municipal power station was pending, while the ECB's hearings on the Witbank power station were in progress. The councillors felt that if the VFP was allowed to establish a successful station in Witbank, it would allow the Company to monopolise electricity sales in the city, thereby making the municipal station defunct – a power station that the mayor called 'our very birthright',²⁹ and for which the City Council promised to fight 'tooth and nail'.³⁰

A report written by the Johannesburg Town Council in 1925 stated that the council's stubbornness in dealing with the VFP, especially regarding the Witbank station, was based on fears that the Company's power supply was prone to regular interruptions. Most of all, the council stated that the ubiquitous thunderstorms that often occur in summer on the Highveld presented too great a threat to the safety of

26. *Government Gazette*, 24 July, 1922', lxxvii-lxxviii; NA, SAB, MNW, 682, MM2990/23, 'Petition of Government Gold Mining Areas (Modderfontein) Consolidated Ltd'.

27. 'Million Pound Power Station', *Rand Daily Mail*, 4 December 1923.

28. *Government Gazette*, 24 July, 1922', lxxix-lxxx; 'Electricity Supply Commission 1923 Annual Report', 6.

29. 'The Town and the VFP: Mayor's Strong Criticism', *Rand Daily Mail*, 30 October 1923.

30. 'A Corner in Power?', *Rand Daily Mail*, 20 October 1923.

the VFP's transmission lines.³¹ This animosity between the Johannesburg Municipality and the VFP was hardly new, and it persisted until well after the Witbank station had been completed. In 1930, Bernard Price told the Empire Mining and Metallurgical Congress that Johannesburg was the only major municipality on the Rand that did not take electricity from the Company.³² Eskom saw the council's objections to the VFP's Witbank application as an attempt to restore the Labour Party's public image after municipal employees who had participated in the Rand Revolt (1922) had been fired. According to an internal memo, Eskom believed that many of these civil servants had socialist and bolshevist sympathies and that the Labour Party wanted to regain its lost credibility by forcing the city to reinstate those workers.³³

The VFP's representatives managed to establish an interim agreement with Eskom to amend the Company's original application, which helped to settle most of the objections that Eskom had brought to the hearings. The VFP and Eskom created an unusual set of rules for building and operating the prospective Witbank Power Station that would stay in place for more than two decades after the station was constructed. Under these terms, the VFP was allowed to apply for a license to construct and operate a power station in the vicinity of Witbank but would not be permitted to supply electricity directly to customers in the town of Witbank itself. Instead, ownership of the station would rest with both the VFP and Eskom, thereby allowing Eskom to sell some of the generated electricity to their consumers in Witbank.³⁴

The VFP also had to agree to amend the licence application by changing the proposed area of supply covered by the licence. Instead of being granted control over transmission and distribution of power from Witbank, the Company allowed Eskom to apply for local distribution rights to supply the Witbank area from the new station, while maintaining control over the high-voltage lines that would connect Witbank and the Rand.³⁵ In the final agreement, Eskom would not be allowed to request supply in areas that were already supplied by the VFP, except where the Railways Administration requested electricity supply along sections of their rail lines.³⁶

In exchange for these concessions, Eskom would recompense the Company for their share of the station's construction costs and pay for a percentage of the monthly operating costs once the station was completed. During months when

31. NA, SAB, MNW, 717, MM1288/24, 'Report on the New Power Station of the Gas and Electric Supply Department'.

32. UCT, BC697, A15.6, 'Power Supply on the Rand'.

33. NA, SAB, MNW, 687, MM3396/23, 'Untitled Memo'.

34. NA, SAB, PM, 1/2/56, 15/6, 'Draft Heads of Agreement'.

35. NA, SAB, MNW, 634, MM2879/22, 'Twenty-Second Meeting'.

36. NA, SAB, PM, 1/2/56, 15/6, 'Draft Heads of Agreement'.

Eskom's share of the station generated more power than was needed, they reserved the right to deduct the costs of generating power from their monthly payment to the VFP, effectively forcing the Company to buy the surplus electricity generated for Eskom's customers.³⁷ When the final agreement between the two organisations was completed, the VFP had also agreed to apply the same scheme that offered lower rates to the mining companies to all their customers taking supply from Witbank.³⁸ The ECB granted the Company the license to begin construction at Witbank on 21 July 1924 and Eskom was given permission to supply their consumers in the area on 6 April 1925.³⁹ By the end of 1926, the Company had invested £1 299 054 in construction, which included materials, land purchases, machinery and interest.⁴⁰

Charles Merz, the consulting engineer who had mediated between Eskom and the VFP in the negotiations, wrote to Jan Smuts that these arrangements would ensure that '...the Commission will not, before the work proceeds, have to make arrangements for finance...' and that the VFP's participation in the construction and operation of the station would protect Eskom against potential financial losses if electricity demand proved to be lower than expected.⁴¹ While Eskom was investigating the feasibility of operating a station from Witbank before the first public hearings in front of the ECB, the parastatal did express some concern about the demand for electricity in the area surrounding Witbank. The load in the immediate surroundings was not high enough to guarantee that the station would be profitable, since secondary industry in the area was still relatively undeveloped and the collieries did not use as much power as the gold mines. There were two suggested solutions to this problem – either electrify the railway lines running from the western edges of the Reef in Germiston and Springs to the Eastern Transvaal, or convince the VFP to buy a large bulk supply from the Commission on a monthly basis.⁴²

After Witbank: The Rand Extension Undertaking, Klip Power Station, and Vaal Power Station

Even with the massive Witbank Power Station running, Eskom and the VFP still had to add to the available generating capacity in the Transvaal. Interwar electrical demand had increased so rapidly that the station had already required the installation

37. NA, SAB, PM, 1/2/56, 15/6, 'Draft Heads of Agreement'.

38. NA, SAB, MNW, 717, MM1367/24, 'Agreement Relating to the Generating Station at Witbank Transvaal'.

39. NA, SAB, MNW, 717, MM1367/24, 'Report of the Commission on the Establishment of an Electrical Undertaking at Witbank (Transvaal)'; and 'Electricity Supply Commission 1924 Annual Report'.

40. 'Electricity Supply Commission 1926 Annual Report'.

41. NA, SAB, PM, 1/2/56, 15/6, 'Charles H. Merz to J.C. Smuts, 2 November 1923'.

42. NA, SAB, PM, 1/2/56/, 15/6, 'Application of the Victoria Falls and Transvaal Power Company'.

of extra generators in 1929 and 1930.⁴³ After the fifth set of generators were installed in 1930, the site in Witbank could not be extended any further, because the Olifants River could not supply sufficient extra water for a sixth set of generators and boilers. The Company also needed to decommission its power station at Simmerpan, which was only useful for generating extra power to boost capacity during peak hours.⁴⁴

In March 1934, Eskom applied for permission for a new power station that would be built near to Vereeniging and permission to begin supply from a new undertaking in the region of the Rand. Once the ECB approved these licence applications, the permits were ceded to the VFP as a continuation of the cooperation between Eskom and the VFP in building and operating power stations.⁴⁵ Electricity for the Rand Extension Undertaking was taken from Eskom's power stations at Witbank and the new Klip Power Station near Vereeniging, as well as from the VFP's Rosherville, Brakpan, Simmerpan, and Vereeniging Power Stations.⁴⁶

Klip Power Station needed large quantities of water for cooling, and there was no guarantee that enough water would be available to meet the needs of future expansion in generating capacity. To ensure that the power station had an adequate supply of water for the foreseeable future, Eskom made a deal with the government to give £81 000 towards the cost of the Vaalbank Dam. In exchange, Eskom was given the rights to use an extra 12 million gallons (approximately 54.5 million litres) of water per day from the Vaal River.⁴⁷ Once construction on the Vaal Power Station started in early 1939, Eskom's contribution to the Vaalbank Dam increased to £124 875. The extra contribution to the dam's construction gave Eskom the right to take 18.5 million gallons (roughly 84.1 million litres) of water per day from the Vaal.⁴⁸ The negotiations between the VFP and Eskom were yet again mediated by Charles Merz, much to the consternation of the VFP's Chairman, Arthur Hadley.⁴⁹ This was probably the last significant Eskom project in which Merz was directly involved – he and several family members were killed in an air raid during the Blitz in October 1940.⁵⁰

In March 1939, while construction work was still in progress on the Klip Power Station, work started on another new power station near Heilbron in the Orange Free

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43. 'Electricity Supply Commission 1928 Annual Report'; 'Electricity Supply Commission 1929 Annual Report'; 'Electricity Supply Commission 1930 Annual Report'.
 44. UCT, BC697, A15.3, 'Rand Power'.
 45. 'Electricity Supply Commission 1933 Annual Report', 5.
 46. 'Electricity Supply Commission 1935 Annual Report'.
 47. 'Electricity Supply Commission 1936 Annual Report'.
 48. 'Electricity Supply Commission 1943 Annual Report'.
 49. Christie, *Electricity, Industry and Class*, 127. Hadley disliked Merz so much that even in correspondence with Bernard Price, who had maintained a close relationship with Merz for several years, he referred to Merz as Eskom's 'yard dog'.
 50. 'Charles H. Merz, D.Sc', *Journal of the Institution of Electrical Engineers*, 87, (1940), 528.

State. This station, known as the Vaal Generating Station Undertaking, was designed to have a capacity of up to 400 megawatts (MW) and required cooling towers that could handle twice the hourly throughput of the towers at the Klip station.⁵¹ The last two generating sets at the Klip Power Station were synchronised to the grid and put into commercial service in January and July 1940.⁵² Construction at the Vaal Power Station was slowed by wartime shortages after September 1939, especially since the main turbines had been ordered from Sweden and could not be exported to South Africa after the outbreak of hostilities. However, the overall electricity requirements on the Rand decreased as mining demands dropped, which gave the Commission some extra time in which to complete construction.⁵³

Integration into the System: Eskom's Purchase of the VFP in 1948

The co-operative agreements between Eskom and the VFP had been tremendously beneficial to both parties – Eskom financed the construction of new power stations between the early 1920s and the outbreak of World War II, while the VFP had been responsible for staffing and operating these stations. This arrangement meant that the VFP did not need to accumulate the substantial capital necessary for building the power stations, and Eskom did not have to worry about the rapid expansion of trade unions and industrial strikes that were taking hold amongst South African workers in the interwar period. It was easier for Eskom to find financing for new power stations because of its standing as a state institution, while also selling power indirectly to the mining industry.⁵⁴

However, as Nancy Clark has stated, Eskom had been given a mandate to supply electricity at low cost and in abundance. Lowering costs through economies of scale was difficult, if not outright impossible if the parastatal was functioning almost exclusively as 'a wholesale producer.'⁵⁵ In 1947, the last full year in which the VFP was acting as an independent company, Eskom's bulk sales for mining and municipal resale accounted for 85.1 percent of the total sales during the year. Of these bulk sales, almost 88 percent was being sold to the VFP for resale to mining consumers.⁵⁶ In essence, almost three-quarters of the electricity generated by Eskom was being sold to consumers at higher prices than if the same number of units were purchased directly from the parastatal. To shift Eskom's role from that of wholesaler to that of retailer, the Commission needed to eliminate as many intermediaries as possible.⁵⁷

51. 'Electricity Supply Commission 1938 Annual Report'.

52. 'Electricity Supply Commission 1940 Annual Report'.

53. 'Escom 1943 Annual Report'; 'Electricity Supply Commission 1944 Annual Report'.

54. Christie, *Electricity, Industry and Class*, 114-115.

55. Clark, *Manufacturing Apartheid*, 84.

56. 'Electricity Supply Commission 1947 Annual Report'.

57. Christie, *Electricity, Industry and Class*, 145-147; *Clark, *Manufacturing Apartheid*, 84.

The Electricity Act of 1922 had granted Eskom the right to give notice of their intention to expropriate the VFP in 1948, which would allow the parastatal to take ownership of the Company in 1950. Hendrik van der Bijl (who had been Chairman of Eskom since its establishment in 1923), the President of the Chamber of Mines, and the Minister of Economic Development decided instead to give notice of Eskom's wish to begin negotiations with the VFP in February 1947. By beginning the negotiations earlier than the Electricity Act allowed, Eskom would be purchasing the VFP's assets, not expropriating the Company outright.⁵⁸ Van der Bijl had been preparing for the expected expropriation since the VFP and Eskom were planning the construction of the Klip Power Station in 1937. As part of the final agreement between the two organisations, the Klip station would be the last power station that the Company was allowed to operate until expropriation. Furthermore, the installed capacity at existing stations had to remain at the same levels as they been in 1937.⁵⁹

There was a measure of uncertainty about whether Eskom could expect to expropriate the VFP in 1945 or 1948. This arose because the Power Act granted the government permission to expropriate privately owned generating stations and associated infrastructure for 35 years after the company's licence was issued. The Electricity Act of 1922 had changed this time limit to thirty-eight years after granting of the licence, but also specified that the terms governing any licences which had been granted under the previous law were to remain unchanged.⁶⁰

To work around this problem, a tripartite series of negotiations were undertaken with representatives from the VFP, Eskom, and the Gold Producers' Committee (GPC) to establish the conditions and amount for which Eskom would purchase the VFP. After a protracted process of discussions and compromises that continued from 1945 until May 1948, the three parties concluded that Eskom would pay £14 500 000 for a complete buy-out of the VFP.⁶¹ This purchase included the power stations at Rosherville, Simmer Pan, Vereeniging, and Brakpan to Eskom's generating system, which granted a cumulative total of 297 600 kW of electrical generating capacity and 117 600 kW of compressed air capacity to the grid. There were also 41 miles (65.9 km) of compressed air pipeline; 711 miles (1 144 km) of power and telephone lines; 1 309 miles (2106.6 km) of transmission power lines; 18 distribution substations; and 918 transformers added to Eskom's total generating and transmission system.⁶²

58. NA, SAB, HEN, 3387, 508, 'Report of the Commission upon the Establishment of an Electricity Undertaking: Acquisition of the Undertaking of the Victoria Falls and Transvaal Power Company Limited, and The Rand Mines Power Supply Company Limited'.

59. NA, SAB, HEN, 3398, 508, 'H.J. van der Bijl to J.C. Smuts, November 24, 1944'.

60. NA, SAB, HEN, 3387, 508, 'Expropriation of the Victoria Falls and Transvaal Power Company, Ltd'.

61. Christie, *Electricity, Industry and Class*, 145-46.

62. 'Escom 1947 Annual Report'.

Perhaps more noteworthy than what the purchase of the VFP added to the rapidly growing grid is what the purchase signified in political and economic terms. Buying out the assets of the VFP gave Eskom direct access to the vast consumer base of the gold mines on the Witwatersrand and in northern Orange Free State. This was important because it allowed Eskom to begin reaching its objective of supplying abundant power at low cost to all classes of consumers, and because it meant that the large revenue from selling electricity to the mining houses was no longer going to a foreign company. Tim Cross has stated that the purchase of the VFP in 1948 was the defining moment in which Eskom gained a true monopoly over electricity supply in South Africa. It certainly dramatically increased the generating capacity of the parastatal, but Eskom was not yet in ‘complete control over the electricity industry.’⁶³

Conclusion

The Victoria Falls and Transvaal Power Company contributed significantly to the growth and formation of South Africa’s national electrical generation capacity. As a vital part of the early development of what has become the national electricity grid, the VFP has been examined by scholars, such as Renfrew Christie and Nancy Clark, as well as by non-academic authors, such as Conradie and Messerschmidt. However, previous academic analyses have tended to focus on the relationships between national economic policy, racial politics, and the growth of government-owned companies, such as Eskom. These analyses were necessary contributions in scholarly understanding of how these national policies drove the development of the country’s economy in the twentieth century. However, these policies often played less of a role in the arguments against private investment in utility services, such as electrical generation and consumption, than concerns about who was given the right to generate and supply this power.

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