

The Oppressor's Toolbox: The Origin of Nuclear Energy Semiotics in  
South African Technopolitics

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### **Abstract**

This paper provides analysis on the semiotics of nuclear energy technopolitics in South Africa. Through a close read of scholarly articles, media sources, and interviews as well as analysis of primary source documents, I provide analysis on the social shaping of public policy and opinions on nuclear energy and mark notable shifts as they relate to historical events, with a focused apartheid and post-apartheid perspective. This paper identifies symbolism of nuclear energy at several points in South African history and discusses its derivation and cultural influence on technopolitics. Through examination of chronological phases in the symbolism of nuclear energy, I address the question of how South Africa's relationship with nuclear energy evolved into its contemporary form.

*Keywords:* Nuclear energy, nuclear, apartheid, post-apartheid, technopolitics, South Africa,

## **The Oppressor's Toolbox: The Origin of Nuclear Energy Semiotics in South African Technopolitics**

Africa produces about 18% of the world's uranium, with Niger as the fifth richest uranium country globally (Barchiesi, 2016). However, there is only one nuclear power plant in the entire continent. Located in South Africa, it powers only 5% of the impoverished country's residential and commercial energy supply (Eskom Holdings). This can be attributed to a number of factors, including cost of expanding nuclear fuel distribution, government corruption in policy, and the culture and opinions that surround nuclear energy as a result of its history. Nuclear energy has complex symbolism in South Africa due to its association with very recent oppression of citizens of color at the hands of the Afrikaner National Party. In their authoritarian regime, the national party aimed to escape condemnation of the relatively democratic world powers by concealing their oppression through tools, many of which have come to symbolize apartheid and retained that symbolism post-apartheid. Nuclear energy is one of these symbols, and I discuss the affects of its development under apartheid in South African technopolitics.

### **Rhetorical Analysis Tools**

In my analysis of scholarly articles, interviews, and various primary source documents, I utilized various methods based on the document's specific rhetorical situation and its subsequent function in this research. These sources served two main purposes: historical narrative and semiotic analysis. Scholarly articles and contemporary media sources mainly supplied the former while primary source documents and interviews were predominantly the latter. In assessing apartheid and post-apartheid semiotics, I attempted to identify the identity of the rhetorician through the broader context provided by historical narrative and conclude opinions based on the perceived purpose and use of appeals. I noted

common themes present throughout this research and developed the argument presented in this paper based on what aligned in the historical context and rhetorician for most if not all of the sources. Resultantly, this paper is a discussion of significant events and unconscious cultural patterns which have impacted legislation and symbolism of nuclear energy from the perspective of apartheid.

### **The Language of Technopolitics**

Linguistic theory describes language as a formal system of signs created for the expression of thought. In his book, Noam Chomsky (2015) discusses the symbolic purpose of language in communicating internal and external processes:

How elements of language relate to other things in the world. Perhaps the simplest, least controversial...the semantic properties of linguistic expressions focus attention on selected aspects of the world as it is taken to be by various cognitive systems, and provide perspectives from which to view them, as we use language for expressing or clarifying our thoughts, inducing others whose language resembles ours to do likewise, making requests, and in other ordinary ways. I think this is also probably the strongest general statement that can be made about the language– world relation. (p. 50)

The gruesome history of nuclear energy is implied through syntax universally and especially in South African dialogue. Compounding on history specific to nuclear reactions, The authoritarian Afrikaner government that introduced uranium mining in the country has tarnished the relationship between South Africa and nuclear energy. As it relates to apartheid, language was one of many tools used to communicate and influence opinion on regime in South Africa. Delusive legislation provided the legal basis for oppression of black africans and as a result, systems and technologies developed under apartheid symbolize the Afrikaner National Party and their atrocities against South Africa.

## **The Atom Bomb**

The term “weapons of mass destruction” was first coined in 1937 to describe the purpose of the German nuclear energy project, one of the earliest research efforts on the applications of nuclear reactions in the military. This was the world’s introduction to nuclear energy, and the first developments in nuclear energy focused on creating new and effective World War II weaponry. Enrico Fermi and Edward Teller led a team of scientists at the University of Chicago to initiate the world’s first self-sustaining nuclear chain reaction. Starting early 1942, the team developed their theories and, by November that same year, successfully constructed Chicago Pile-1, the world’s first nuclear reactor. Code-named the Manhattan Project, these developments led to the creation of the world’s first atomic bomb and the infamous bombings of Japanese cities Hiroshima and Nagasaki in 1945 (DOE, 1994).

With this introduction, nuclear energy became synonymous with war, death, and destruction. The world was catapulted into the nuclear age and before the general public could grasp any understanding of nuclear energy and the versatility of its use, people were inundated with images of mushroom clouds over barren cities and horrific videos of children with missing limbs, crying amongst the rubble that was once their home. This imagery was captioned with headlines such as “the aftermath of nuclear warfare” and “destruction from nukes”. The word “nuclear” had never been printed outside of academic journals before WWII (CNS & RNS, 2016), and its debut on newspapers linking it to the death of 129,000 has left a lasting impact on public-opinion surrounding its use. People now and then are still affected by the trauma and threat of nuclear warfare, as the term itself holds the stigma of its initial use. However, had the research of Fermi, Teller, and other nuclear physicists received significant funding outside of wartime, the advancements of nuclear energy may not have been inextricably linked to the death and destruction of the atom bomb.

South Africa, like the rest of the world, was embroiled in the geopolitical rhetoric of the Cold War. The use of nuclear technology furthered the separation between the East and the West, undeveloped and developed nations (Edwards & Hecht, 2010). In an effort to assert power, nuclear energy was introduced to the African continent through the passage of the

Atomic Energy Act of 1948. This legislation led to the formation of the South African Atomic Energy Board and Energy Corporation (SAAEB and SAAEC) which were established to mine the country's uranium (Atomic Heritage Foundation, 2018). This was a statement of sophistication and elitism in military and modern energy technology that sowed feelings of unease in the hands of South Africa's current political body.

## **Environmental Racism of Apartheid**

### ***Forced Eviction***

Though white supremacy and racial segregation were central aspects of South African legislation decades before apartheid, the election of the Afrikaner National Party in 1948 is what many historians mark as the official start of one of the worst periods of racial atrocities and state instigated tribal warfare in the nation (Urwin, 2019). Afrikaans for "the apartness", apartheid was the party's slogan, and the atrocities caused by their government have tainted all laws written during this time.

The authoritarian environmentalism of colonial South Africa was intensified by apartheid, and the victory of the National Party marked the politicization of environmental protection. Through legislation in the energy and environmental-conservation sector, the national party aimed to separate black citizens from their homeland and reclaim it as property of white nationalists. Game protection laws in effect since 1795 provided the foundation for legal restrictions on areas deemed "natural" and necessary for "wildlife preservation" (Ismail & Khembo, 2015). Black citizens were forcibly evicted from lands with tribal and ancestral significance under the guise of environmental-conservation and as they were displaced, citizens were exposed to the risks of urbanization through forced proximity to energy plants (Leonard, 2013).

The weaponization of environmental protection against South Africans has created a distrust in energy policy and in modern conservationist developments as a whole. In an attempt to censure the eviction of citizens, the government pushed a narrative of their pseudo

conservation agenda, creating an observed correlation between environmental justice and racial injustice. Contemporary arguments of nuclear energy as a means to reduce environmental impact mirror the lies and justification of oppression by white nationalists only 70 short years ago. As a result, discussions of nuclear energy are perceived by the public as attempts to conceal corruption in history books and lawmaking while oppressionist systems thrive, based on these very recent historical events. With similar information coming from a similar source, it is impossible to separate these narratives from one another to decipher validity of the information.

This lasting symbolism of nuclear energy as a political sham prevents real technological discourse and is an overlooked example of the numerous ways Africans are still scarred both mentally and physically by apartheid regime. The people of South Africa still live with these memories and suffer from the burden of corruption and racism that have created controversy around new and innovative technology due to the implications of their use, rather than practicality.

### *Nationalization of Natural Resources*

The SAAEC aimed not only to capitalize the massive supply of uranium on the African continent, but also nationalise its extraction. As the arms race progressed, world powers anxiously sought a monopoly on uranium. In 1950, the United States and United Kingdom signed a contract to buy over 10,000 tons of uranium from South Africa over the next two decades (Atomic Energy Authority, 1950). At the Jan Van Riebeeck festival of 1952, a celebration of the colonization of South Africa, apartheid developments in uranium were named one of the most important metallurgical events in South African history.

Edwards and Hecht (Edwards & Hecht, 2010) describe this as metallurgical nationalism, as the Apartheid government attempted to claim nuclear advancements and create a narrative in which their oppressive government was a necessary authority for modern technological development in South Africa. This has contributed to inane disdain for nuclear energy, for a celebration of the potential benefits of this source is equated to celebration of

the oppressive system that introduced it. Criticism of nuclear developments is an attempt to undermine the narrative of exceptionalism in the national party and many opponents of nuclear energy in South Africa are opponents of assimilation to the Western and nationalist ideals that it symbolizes. In denouncing the atrocities of the Afrikaner National Party, it is somewhat contradictory to acknowledge the welfare that can be achieved through systems used to legalize and perpetuate their persecution of Africans. However, these were instances of corruption and misuse of otherwise progressive advancements. These same laws and systems can be reclaimed for an authentic purpose, and redesigned so that the threat of their exploitation is governed and insignificant in comparison to the prosperity they effect. It can be argued that in boycotting nuclear energy, the national parties' claim on the technology is validated as it supports their self-proclaimed proprietorship. By reclaiming the natural resources and technologies developed from such resources to ameliorate living standards in South Africa, the relationship between black people and the environment of their homeland can begin to mend.

### **Atoms for “Peace”**

In 1959, the South African government approved the creation of nuclear reactors for domestic use and signed a 50-year collaboration with the U.S. through Eisenhower’s “Atoms for Peace” program (Lavoy, 2010). This funded the South African Fundamental Atomic Research Installations, SAFARI -1 and SAFARI -2, constructed in 196 and 7 located in Pelindaba. The project was abandoned just two years later, as focus shifted away from reactor building and toward uranium enrichment. With influence from the U.S. government, Carl de Wet, the South African Minister of Mines, approved a research program on PNEs (Peaceful Nuclear Explosions) in 1971. Wet publicly stated the new program’s purpose of advancing the growing mining industry, but citizens were rightfully fearful of the government’s intent.

The timeline of nuclear weapon development in South Africa is heavily debated. Some historians and activists argue that the National Party never had any peaceful intentions



in their nuclear research. According to a partially declassified report by the U.S. Intelligence agency (UCIA, 1997), South Africa began its nuclear weapons program in 1973.

Continued dishonesty compounded the previously cemented distrust in nuclear advancement. When given the opportunity to challenge society's disbelief in peaceful applications of nuclear energy, the national party chose further deception and reinforced the symbolism of corruption, greed, and oppression in nuclear energy, both proactively and retroactively. Without access to trustworthy and unbiased information, South Africans protested nuclear energy adamantly in the 1950's only to have their opposition validated over 30 years later through the publicization of previously classified information.

### **The Koeberg Station**

Construction of the sole nuclear power plant in Africa began in 1976, in Duynefontein, South Africa, 27km north of Cape Town (Eskom Holdings). Shortly after, members of uMkhonto we Sizwe "Spear of the Nation" (MK), the paramilitary wing of the African National Congress (ANC), plotted to bomb the Koeberg Power Station. Renfrew Christie, one of MK's senior members and closely tied to Nelson Mandela, used his scholarship for innovative anti-apartheid political activism. Christie wrote his doctoral thesis at Oxford on the history of Eskom, South Africa's state owned nuclear utility, granting him access to their archives. He researched weapons of mass destruction from the 1960s until his arrest in 1979 for relaying information to the ANC, then considered terrorism (Davis, 2020). During his trial, broadcasted internationally, Christie confessed to his plot and his blueprint of how to safely blow-up the power station was read aloud. Two years later, Rodney and Heather Wilkinson executed Christie's plan and bombed Koeberg.

This story of triumph resonated with millions of Africans and people globally. It was encouragement and momentum for South Africa activists fighting tirelessly against apartheid, the perfect metaphoric protest of tyranny at the hands of the national party. In illustrating this metaphor, literally blowing-up a power structure, the symbolism of apartheid in Koeberg and nuclear energy was reinforced. Though there were no direct nuclear attacks

on citizens, the Koeberg station represented the effects of Afrikaner nationalism and social control of black-african citizens. Koeberg, like a statue or official building, was a tangible monument of Apartheid in South Africa, a physical structure as a result of the national party's presence and legislation. Both a literal and figurative erection of power, it was an obvious target of the ANC, black radicals, and allies who aimed to dismantle apartheid by any and all viable means. By bombing the station, activists were able to retaliate through demonstrative protest that demanded national attention, called the country to action, and required all to vocally pick their side. Additionally, the stature of MK leadership contributed to the lasting opposition of nuclear energy in South Africa. In the words of Nelson Mandela, Christie is "one of the brightest prospects [South Africa] has ever produced (Davis, 2020) and, through his activism and sacrifice in the fight against apartheid, is a living symbol of triumph over the Afrikaners. Being a white, highly educated scientist, his activism lent credibility to the ANC and his actions greatly influenced public opinion. In this direct action against Koeberg, the station and nuclear energy as a whole were further defined as enemies of the people. Criticism of the bombing on the basis of supporting its use in isotopic medicine or other peaceful applications was no different than defending the national party in the eyes of the public. Christie was revered for his actions and to this day is a prominent figure in anti-nuclear power in South Africa. During his appearance on the Daily Maverick podcast, he states that "Africa is supposed to be a nuclear free zone" (Davis, 2020). Though one may assume he is referring only to nuclear weaponry, it is difficult to decipher whether he is strictly advocating non-proliferation, or if he is against all applications of nuclear energy in South Africa, peaceful or otherwise. Through-out the interview, "nuclear energy", "nuclear weapon" and "nuclear device" are all used interchangeably while discussing the bombing of Koeberg. This alludes to nuclear weaponry and warfare as the only modern and practical application of nuclear energy as all of these widely varying terms are made synonymous.

Recorded in 2020, this interview reflects the views of many South Africa citizens, past and present. Though nuclear energy and nuclear weaponry are distinct technologies, they're discussed amongst both industry professionals and non-physicists as if there is no relevant differentiation. It can be argued that this lack of distinction affects public understanding of nuclear technology and support of technopolitical policy related to nuclear

energy in Africa. This podcast was made available on October 19, 2020, the day after NuScale, a U.S. nuclear energy technology firm, signed a deal with South Africa. Considering Christie's stated opposition to nuclear energy in South Africa, this is likely uncoincidental.

### **Post-Apartheid Progress**

Frederik Willem de Klerk was South Africa's last white president. Born into an influential Afrikaaner family, he was a member of parliament before taking over for P.W. Botha after his resignation from the position. During his presidency, he dismantled South Africa's nuclear weapon's program and made the first official statement admitting to the presence of nuclear weapons on behalf of the National Party. The government never sold the weapons stockpile, and instead reallocated the highly enriched uranium for the country's medical isotope program (Schiwikowski, 2017).

De Klerk's official declaration was not one based completely on moral standing. Though he denounced the program extremely vocally during his presidency, de Klerk was well aware of South Africa's nuclear weapons arsenal as the minister of minerals and energy in 1978. According to Maria Babbage (Babbage, 2004), his eventual public support of nuclear non-proliferation was an attempt to keep these weapons away from the black government that was sure to win with newly signed suffrage. The corruption of this deal soured the victory of nuclear non-proliferation and highlighted the disconnection between the motivations of South African citizens and the government pre-democratic election, a common theme in apartheid related legislation. De Klerk's determination to tie his presidency to dismantling nuclear weapons as a key point in dismantling apartheid reinforced nuclear energy as a symbol of apartheid, as the events exist in the same legislation and public discussions in his attempt to protect his image and appear on the righteous side of history.

Apartheid was dismantled through a series of negotiations between the government under de Klerk, the ANC, and other prominent political organizations, resulting in the

country's first election with universal suffrage in 1994. The ANC won the country's first non-racial election, winning 63% of the vote (Spalding-Fecher, 2002).

The end of apartheid marked the opportunity for progress through nuclear energy. Without the fear of a white nationalist government waging nuclear warfare on African citizens and people of color world wide, newly elected South African officials were much more willing to support legislation that funded nuclear exploration and redirected use of uranium in the country. Also, actual allocation of uranium to peaceful projects as promised decades early proved the existence of such programs to South African citizens, and in the hands of a democratically elected government, was the first widely celebrated use of nuclear energy in the country. The country's medical isotope program was highly profitable and supported by the newly elected ANC. As a result, nuclear energy began to symbolize growth and economic prosperity for the country. Finally achieving transparency in use and separation from corrupt systems, conversations on nuclear power took a swift turn toward the practicality of the technology.

### **Energy Poverty in South Africa**

Regional energy poverty can be described as above-average reliance on traditional biomass as a primary public energy source and below-average access to modern energy (Barnard, 2014). What defines adequate access to modern energy sources is highly debated and varies depending on location specific resources (Khembo, 2015). A common methodology includes measuring both household and commercial energy availability for activities deemed necessary for general health, wellness, and economic prosperity. The IEA (IEA, 2020) acknowledges the lack of a single internationally-adopted definition of modern energy access, but lists significant factors including:

- Household access to a minimum living standard of electricity
- Household access to safe and sustainable cooking and heating fuels and appliances
- Access to modern energy that enables economic productivity
- Access to modern energy powered public services

Most African households experience low or nonexistent access to modern energy sources including coal, solar, hydro power, wind and nuclear energy which power most developed nations (Barnard, 2014). According to the General Household Survey 2019 report, over 5% of South African households still rely on candles as a main source of lighting (STATS SA, 2019).

No matter the standard of measurement, Africa has one of the lowest modern consumption rates globally. Many factors contribute to energy poverty throughout the continent, but the impact of colonial and apartheid regime on energy distribution and stance on the modernization of energy systems is irrefutable. As South Africa enacts legislation to increase nuclear energy on the state power grid, they are effectively repairing the country from decades of imperialism and white nationalism from which citizens suffer.

### **The Future of Nuclear Energy in Africa**

After a period of stagnation, recent deals suggest that nuclear energy may power a larger percentage of South Africa and the African continent in the years to come. 2020 was a critical year in the advancement of South African technopolitics, as the United States International Development Finance Corporation (DFC) removed prohibition on support for nuclear power projects involving small modular reactors in July and signed the aforementioned letter of intent to support NuScale Power in developing 2,500 megawatts of power in South Africa that October. Gwede Mantashe, South Africa's Director of Mineral Resources and Energy, announced these hopeful plans in May, with a goal of completing the procurement process in 2024 (Yurman, 2020). With the now approved support of the DFC, the country is a step closer to achieving what has been in the works for decades. Nuclear deals of previous administrations failed as a result of notorious corruption coupled with a lack of funding and public support (World Nuclear Association, 2020).

Lack of state consensus can be attributed to many factors, but there is a correlation to the relatively unaddressed past of South African technopolitics. It is difficult to attain national support on issues and technologies that have received national criticism with no

governmental attempt at national reconciliation. Though the passage of legislation is monumental in addressing the energy poverty crisis, it is important to facilitate open and honest dialogue about what led to these corrupted systems and how that history will affect the future so that progress isn't halted by repeating mistakes of the past.

## **Conclusion**

This paper aims to bring attention to the symbolism of nuclear energy as it relates to South Africa and foster a discussion about the ways this symbolism may affect current technopolitical legislation and public opinion. My goal is not to encourage the erasure of the past. On the contrary, I hope to amplify its significance and call citizens to consider the effect of past transgressions on current opinions. Power remains in oppressive systems until it is reclaimed through direct action; this reclamation is made through ending restrictions on basic necessity and modern advancement out of fear derived from historical standards. Acknowledge the reality of these patterns and create new standards; fight for modern autonomy. If every society made the decision to halt the use of technologies initially developed by oppressive governments, we would return to a strange dark age. As a result, nuclear energy should be judged as a tool, not a wielder of tools. By focusing criticism on the connotations of this source, the opportunity for exploration and education on its modern use is lost. I am not arguing that implementation under apartheid regime is the only repeated or valid criticism of nuclear energy, but the opportunity for discussion without extraneous bias would allow for those criticisms to be addressed and considered fairly. The only way to reach this objective discourse, is by acknowledging bias and attempting to counteract it. Of course, this is only effective if bias is present rather than the continued transgression leading to such tendencies. Environmentalism and social justice are not mutually exclusive, and fostering conversation on the pretense of that narrative serves the dual purpose of encouraging a world where the influence of such propaganda is diminished while warning of past transgressions in hopes of avoiding repetition.

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