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Intelligence (CAI)
Publication

South Africa's future nuclear energy plans: Pivoting on foreign policy objectives and raising issues of concern for nuclear non-proliferation



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CAI Analytical Research | November 2013
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Executive summary

A decision about South Africa's nuclear future was put on hold in March 2013, again delaying and possibly jeopardising the implementation of the country's atomic expansion programme for the third time in 15 years. The country's ailing state-monopolised electricity sector was subsequently plunged into further turmoil as various alternative base-load energy options surfaced for debate alongside suggestions that renewable energy projects and energy imports may yet overtake the country's nuclear plans. Policy discord dominated mounting public rifts between high-ranking government officials in the ruling African National Congress' (ANC) Tri-partite Alliance and between the Department of Energy (DoE), the National Energy Regulator (NERSA), and President Jacob Zuma's National Planning Commission (NPC). Simultaneously, unhealthy politics surround the state's power utility and the government-designated nuclear plant owner and operator, the Electricity Supply Commission (Eskom), over alleged mismanagement and various other constraints, such as skills shortages and labour unrest. Stifling this debate in July 2013, Zuma asserted his authority to again consolidate his power in a fourth Cabinet reshuffle since taking office in 2009, and promptly took control of the inter-ministerial National Nuclear Energy Executive Coordinating Committee (NNEECC), displacing his Deputy President, Kgalema Motlanthe.

Despite the nuclear plans being under review and an energy policy only likely to be finalised in March 2014, Zuma has also accelerated unbridled efforts to pursue foreign policy pacts that pave the way for the much-vaunted nuclear roll-out. In so doing, Zuma and his Government have been asserting a nuclear diplomacy of South Africa as a nuclear power, both globally and on the African continent. With atomic power appearing to be strongly about South Africa's foreign policy rather than domestic energy supply, Zuma appears to risk propelling the country towards a leadership crisis by riding roughshod over his country's muddled energy policy and supply problems, and by his confused oversight of the country's nuclear industry. A shifting nuclear ideology, along with rising domestic political instability, calls into question South Africa's ability to meet the already challenging international requirements for nuclear non-proliferation.

Of equal concern is that the South African Nuclear Energy Corporation (NECSA) and private 'sister' groups appear to be dictating strategies to Government, while taking advantage of limited public awareness and participation. Regardless of the lack of finalisation regarding the country's energy roadmap, South Africa's secretive public and private nuclear industry seems to be forging ahead undeterred, as if independent and beyond reproach. For instance, NECSA, now de-listed as a state-owned enterprise, has advanced and initiated a strategy for the industrialisation of poorly regulated nuclear technology and has an unclear plan for the 'commercialisation of advanced nuclear energy systems.' Moreover, questions about privatised atomic companies have remained unanswered, while agreements are being forged in preparation of a nuclear infrastructure and fleet roll-out. An inherent danger exists that NECSA will seek to become an independent power producer (IPP) and that with diminished public oversight, its intended atomic fuel-cycle may become as mismanaged as Eskom is. Such a scenario is likely to hold significant risks for South African and global nuclear non-proliferation.

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Introduction and brief overview of previous related CAI reports

This report is an update in a wide-ranging series of CAI reports that have contributed to ongoing analyses on South Africa's nuclear and counter-proliferation environment. This particular report focuses specifically on the policy discord in South Africa's energy sector vis-à-vis its nuclear expansion programme amid escalating concerns for nuclear non-proliferation. To briefly recap on some key observations from previous CAI reports:

South Africa has invested tremendously in its status and identity as a trustworthy nuclear partner, and its participation in non-proliferation regimes has elevated its status as a global normative entrepreneur since the country acceded to the Non-Proliferation Treaty (NPT) in 1991. The democratic South African Government's stance on nuclear issues reflects a remarkable departure from its apartheid-era nuclear weapons programme twenty years ago. Despite this *volte face*, the possibility of South Africa's 'nuclear recidivism' remains real as long as the African National Congress (ANC)-led Government continues to, for example, show a lack of transparency in its lucrative – and controversial – arms' trade. Additionally, South Africa has continued to flex its nuclear muscle, and carved out a niche of nuclear diplomacy for itself, giving rise to several issues and developments that threaten to undermine the trust it has built internationally since 1991. With some signs of state institutional collapse, questionable safety and security at South Africa's nuclear facilities and illicit nuclear trade (with a large number of security-related investigations and recorded incidents between 2004 and 2011); poor border control and corruption; challenges to democratic institutions which reduce oversight; the South African Government needs to address nuclear safety and security now more than ever before.

The Zuma Government has continuously marginalised oversight bodies such as Parliament, the National Conventional Arms Control Committee (NCACC) and the South African Council for the Non-Proliferation of Weapons of Mass Destruction (NPC). A lack of public debate on the country's nuclear future and, for example, the upgrading of its missile launch facilities has fuelled concerns. These concerns are amplified by the country's controversial and increasingly non-transparent regulation of the defence industry, and an increasing trend toward secretive government behaviour. The nuclear programme and both South Africa's missile and satellite development programmes are remnants of the country's apartheid past. In many respects South Africa's legacy of a lack of transparency is as prevalent today as it was during the apartheid-era, putting the atomic industry virtually above an assortment of far-reaching legislation that should prevent non-accountability.

The immediate post-apartheid period was characterised by the continuation of relations with the apartheid government's nuclear partners and the establishment of a multitude of new bilateral relations. South Africa used its status as a country that dismantled its nuclear weapons programme very effectively and was initially hesitant to add nuclear issues to bilateral agendas fearing global distrust of its motives. Towards the end of the 1990s however, the South African Government increasingly concluded nuclear-related bilateral agreements, including agreements with so-called rogue or deviant states, exposing several strategic challenges for South Africa. South Africa's foreign nuclear agreements have continued despite its energy policy ostensibly returning to the drawing board. South Africa has also positioned itself as a multilateral activist in nuclear non-proliferation speaking on behalf of developing countries, and has nurtured a strong relationship with the International Atomic Energy Agency (IAEA). Indeed, South Africa now also heads and hosts the African Commission on Nuclear Energy (AFCONE), which was established in 2010 as a compliance body of the Africa Nuclear Weapons Free Zone (ANWFZ) known as the Pelindaba Treaty, and will act as an African version of the IAEA. While working closely with the IAEA to foster nuclear ambitions on the African continent, several factors have given rise to concerns for nuclear non-proliferation as AFCONE is not yet operational, its mandate remains unclear, and it seems to have given rise to an emerging nuclear envy among African states vying for prominence both in African politics and atomic development.

Bolstered by broad strategic backing, President Jacob Zuma's defiance of global nuclear security regime pressure to curb the future production of highly-enriched uranium (HEU) has also raised concern that the country may be aiming for a more autonomous approach to atomic development. Coming, as it does, alongside South African



support of the inappropriate misuse of the “nuclear deterrence” stance of non-nuclear weapon states as a bargaining tool in ongoing challenges at the faltering NPT, the country plays an influential role in global politics.

Yet, not a single South African-based nuclear trafficker linked in 2004 to Pakistani nuclear scientist A Q Khan’s underground atomic network is in jail. One of the cases disappeared without explanation and the outcomes of other possible nuclear proliferation cases in South Africa have been veiled in secrecy or remain unresolved, leaving many questions unanswered.

Developments within the ruling party signal the emergence of a more hard-line and ambitious younger elite, who seem to be more power-hungry and operate in a culture of impunity and unaccountability. These developments may undermine South Africa’s commitments to the NPT in future. Consistent concerns persist regarding South Africa’s ability to assemble nuclear weapons and the country’s arms trade (including equipment compatible with nuclear arms), which have been raised since the President’s inauguration and contradict some of its international relations principles.

CAI’s Counter Proliferation Research Unit

CAI’s Counter Proliferation (CP) research unit was founded in 2008 to undertake tailored research that **examines the real potential and risks for nuclear non-proliferation on the African continent**. The unit also serves to foster policy dialogue on the important role that Africa can play to enhance global nuclear security.



Our team of academics and experts in nuclear politics examine and analyse large amounts of data on nuclear geopolitics that impact African countries and their global relationships, to produce reports that have become **an indispensable tool for anyone with stakes in global and African nuclear security**. A peer-reviewed procedure has ensured accuracy and high-quality, insight-driven, value-added indigenous analytic intelligence that is independent, non-partisan and Africa-based.

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South Africa's delayed nuclear plan plunges it into policy discord and energy insecurity

South Africa's nuclear plan is again put on hold and is up for policy disputes in government

South Africa's nuclear decision, contained in the 2010 *Integrated Resources Plan* (IRP),¹ and approved by Cabinet in May 2011, was put on hold in March 2013 for the third time since the ANC came into power. However, major policy disputes within the government emerged after the fledgling National Planning Commission (NPC), located in The Presidency, called a nuclear option for the country into question, despite the International Atomic Energy Agency's (IAEA) supportive visit earlier in 2013.² One explanation for this development is possibly that historically the ANC was divided on the use of nuclear energy – even for peaceful purposes. Additionally, nuclear energy and its industrialisation have been embedded in a number of other government policies to date, often without being questioned. While the 20-year electricity development plan of the IRP envisages a nuclear fleet of six power reactors and associated full fuel-cycle infrastructure to add a 9,600 MW nuclear capacity to the national grid by 2033, nuclear industrialisation provisions are also contained in the country's *Industrial Policy Action Plan* (IPAP3), now in its fifth iteration³ since it was first published in 2007, and is summarised in the Insight Box below. Adopted by Cabinet in March 2013, it is informed by the vision set out by the *National Development Plan* (NDP), as well as the *New Growth Path* (NGP) and the country's *National Industrial Policy Framework* (NIPF).⁴ However, the ANC-endorsed NDP of the NPC put forth in 2012 underpins the government's guiding socio-economic framework over the next 20 years in terms of the NPC's *Vision 2030* document,⁵ which states that there needs to be a review and costing of the planned nuclear expansion.⁶

Development of nuclear industrial complex

Focus areas of the South African Government's 10-year Industrial Policy Action Plan (IPAP) approved by the Zuma Cabinet in February 2010:

- **Cluster 1** - New areas including metals fabrication, transport equipment, energy industries & agro-processing
- **Cluster 2** - Automotive sector, minerals, pharmaceuticals and chemicals; clothing, textiles, footwear, and leather; bio-fuels; forestry, paper and pulp furniture; cultural industries and tourism; and business process outsourcing
- **Cluster 3** - Develop long-term advanced capabilities including nuclear and advanced materials and aerospace capabilities

Source: Rob Davies (Minister of Trade and Industry), Briefing to the Portfolio Committee on Trade and Industry on the Revised Industrial Policy Action Plan, 23 February 2010. Available at: <http://www.pmg.org.za>; for more on this see "Emerging issues and possible future trends in South Africa's nuclear and counter-proliferation landscape", CAI, March 2010.

The NPC's concerns about the financing, safety, timing and previous assumptions of nuclear energy remained uncontested until it unilaterally commissioned a new energy model from the University of Cape Town's Energy

¹ Department of Energy (DoE), "The Integrated Resources Plan (IRP)", 2010. Available at: www.doe-irp.co.za.

² The final report of South Africa's nuclear readiness assessment in an Integrated Nuclear Energy Review (INIR) undertaken by the IAEA was handed to the government in May but has yet to be made public.

³ Department of Trade and Industry (DTI), "Industrial Policy Action Plan (IPAP) 2013/14 – 2015/16", 2013. Available at: <http://www.thedti.gov.za>.

⁴ "Industrial Policy Action Plan", February 2011. Available at: <http://www.info.gov.za>; "Statement on Cabinet meeting", 13 March 2013. Available at: <http://www.info.gov.za/speech>.

⁵ "Vision for 2030", National Development Plan (NDP) document of the National Planning Commission (NPC), 11 November 2011. Available at: <http://www.npconline.co.za>.

⁶ *Ibid.*



Research Centre (ERC). In April 2013, the ERC produced a report for the NPC that made the case to delay the commissioning of nuclear power-plants to at least 2029, and possibly completely replace them with other forms of low-emission energy.⁷ Ignoring new information on higher costs, lower-than-expected future demand, and “fixing decisions, including a nuclear roll-out of large units on an outdated plan are going to be costly to the economy,” the report asserted.⁸ In part, the report’s assumption is due to the additional major centralised coal-fired power plants currently under construction in South Africa, namely Medupi (since 2007) and Kusile (since 2008). Both are expected to be commissioned in 2017 and 2014, respectively. The Ingula pumped storage scheme (since 2006) is also due for commissioning in 2014.⁹ In May 2013, Eskom¹⁰ deliberated a decision to bring forward construction of a third new coal-fired power station, Coal 3, which was approved by Cabinet in August 2013,¹¹ despite expectations that nuclear and renewable power would provide the bulk of new power. However, prompted by the death of six workers at Ingula in November 2013, Eskom suspended work at all its construction sites to allow for an assessment of safety and security systems across all operations, irrespective of project timelines.¹² Eskom is the government-designated nuclear plant owner and operator of the current Koeberg nuclear power station in the Western Cape Province, and also of the country’s intended six-reactor nuclear fleet.

Energy Department digs in its heels with nuclear as a ‘non-negotiable’ policy

South Africa’s Department of Energy (DoE) adopted the *Nuclear Energy Policy* that was promulgated in June 2008,¹³ and declared that South Africa would reach a point of no return on its energy-building programme in early 2013.¹⁴ In April 2013, having delayed the two-year review of the IRP, the DoE issued a stinging rebuke of the country’s over-arching strategic long-term planners in the NPC, stating that the nuclear option was “non-negotiable” and an essential part of its plans to meet targets to reduce greenhouse gas emissions.¹⁵ Nevertheless, the DoE reluctantly agreed to return the country’s now outdated IRP to the drawing board and to finalise the long-outstanding overall energy master plan, the *Integrated Energy Plan* (IEP), but it reiterated that the nuclear plan was not up for review. The DoE intends to finalise the IEP by the end of 2013, at the earliest, and is obliged to involve public participation. By September 2013, the Energy Department stated that the government had made a firm commitment to start the procurement process for the construction of a fleet of nuclear power stations by the end of the financial year in March 2014, with a procurement roadmap in place by November 2013,¹⁶ putting trillions of rands in nuclear electricity infrastructure back into contention nearly four years after it was first mooted.¹⁷

Despite the intention of the NPC report to firmly put the nuclear energy issue up for public debate, Public Enterprises (PE) Minister Malusi Gigaba asserted that the Cabinet remained “resolute” about developing nuclear capacity, with Eskom at the helm and under his oversight.¹⁸ Gigaba also stated that the top-level inter-ministerial

⁷ “Towards a new power plan”, Energy Research Centre, University of Cape Town, April 2013. Available at: <http://www.erc.uct.ac.za>.

⁸ *Ibid.*

⁹ O’Flaherty, P., “Eskom presentation to the Parliamentary Portfolio Committee on Energy”, Cape Town, 21 August 2012.

¹⁰ MacKay, D., “SA urged to treat ‘Coal 3’ with caution”, Miningmx, 28 May 2013. Available at: <http://www.miningmx.com>.

¹¹ Statement by Minister Rob Davies (Trade and Industry) on the Cabinet Lekgotla held from 13 to 15 August, Government Communications and Information System (GCIS), 22 August 2013. Available at: <http://www.gcis.gov.za>.

¹² Greve, N., “Eskom suspends construction at all sites following Ingula fatalities”, Engineering News, 1 November 2013. Available at: <http://www.engineeringnews.co.za>.

¹³ “Nuclear energy policy for the Republic of South Africa”, Department of Minerals and Energy (DME), June 2008. Available at: <http://www.energy.gov.za>.

¹⁴ Creamer, T., “SA to make nuclear build decision by June”, Engineering News, 22 February 2013. Available at: <http://www.engineeringnews.co.za>.

¹⁵ Faull, L., “Energy: Nuclear warning sparks meltdown”, Mail & Guardian, 26 April 2013. Available at: <http://mg.co.za>.

¹⁶ Speech by Nelisiwe Magubane, Director-General of Energy, to the Nuclear Industry Association of South Africa (NIASA) Convention in Port Elizabeth, 14 August 2013. Available at: <http://www.info.gov.za>.

¹⁷ “SA pressing ahead with nuclear plans”, South African Info, 27 September 2013. Available at: <http://www.southafrica.info>.

¹⁸ Ensor, L., “Cabinet set on nuclear plan, with Eskom at the helm”, Business Day, 9 May 2013. Available at: <http://www.bdlive.co.za>.



National Nuclear Energy Executive Co-ordinating Committee (NNEECC), which is discussed below, would make known its decisions on nuclear commissioning in 2013. The declarations of both the PE minister and the DoE officials are now improbable, at least in the short term.

Nuclear spend schisms spread, fuelled by concerns of corruption as Zuma takes over the nuclear seat

The aforementioned policy schisms on South Africa's multi-billion Rand nuclear option spread quickly in the ruling party and in government, and it increased pressure across the spectrum of energy stakeholders, including the NPC, for corruption to be combated and non-transparent energy deals to come to an end.¹⁹ The country's nuclear plan, as outlined in previous reports, constitutes the biggest spending plan in its history. Thus, rifts mounted not only between the NPC and the DoE, but also between high-ranking government officials in the ANC's Tri-partite Alliance, NERSA, energy officials, political elites, planning think-tanks within government departments, and within Eskom.

Eskom has favoured a nuclear expansion programme in South Africa since the end of Apartheid in 1994 by, for example, backing the government's costly and now-defunct Pebble Bed Modular Reactor (PBMR) project, largely to the detriment of the development of alternative energy planning and energy security.²⁰ Amid the policy clashes over South Africa's nuclear ambitions, the state-owned Industrial Development Corporation (IDC), a shareholder in the PBMR project, also entered the fray and urged Parliament to kick-start its green economic initiatives for economic development.²¹ In 2013, the influential private Energy Intensive User Group (EIUG) also called for an urgent policy rethink of South Africa's "inflexible" nuclear plan.²² By mid-2013, Zuma glibly reaffirmed the NDP's 'road map' status, while stressing other economic strategies, but only after being prompted to do so in Parliament by the Minister in the Presidency, Trevor Manuel, who is also in charge of the NPC.²³

However, in July 2013, Zuma asserted his authority to again consolidate his power in a fourth Cabinet reshuffle since taking office in 2009, replacing and switching his Energy Minister, Dipuo Peters, with loyalist, Transport Minister Ben Martins.²⁴ In a surprise move that was leaked to the media, Zuma also promptly took control of the inter-ministerial NNEECC that was appointed in November 2011, displacing his Deputy President Kgalema Motlanthe, and has since effectively stifled the policy debate.²⁵ The nuclear committee (outlined in Table 1 below) now includes six ministers of energy, public enterprises, finance, state security, defence and international relations, with the actively pro-nuclear energy department serving as a secretariat.²⁶ It is not clear what other changes have been made regarding the significant duplicitous and costly bureaucracy that grew in various entities in the past decade to deal with South Africa's impending new nuclear build programme. Many departments and committees sprung up amid a litany of secrecy, cronyism, revolving doors and rampant corruption, largely involving ambitious and opportunistic elites (discussed in a previous report).²⁷ Nevertheless, Zuma's takeover of the NNEECC could be considered to highlight the continued lack of transparency and ongoing secrecy by government when it comes to nuclear energy plans.

¹⁹ "Dodgy energy deals: Combating corruption and improving procurement in South Africa", Earthlife Africa, May 2013. Available at: <http://www.earthlife.org.za>.

²⁰ See "The status of South Africa's abandoned Pebble Bed Modular Reactor (PBMR) project", CAI, April 2013.

²¹ Small Enterprise Finance Agency & Industrial Development Corporation (IDC) Strategic Plans 2013 briefing on the implications of green economy on economic development to the Economic Development Portfolio Committee, Parliament, Cape Town, 17 April 2013. Available at: <http://www.pmg.org.za>.

²² Creamer, T., "EIUG head calls for rethink on SA's nuclear plan", Engineering News, 11 January 2013. Available at: <http://www.engineeringnews.co.za>.

²³ Address by President Jacob Zuma on the occasion of The Presidency Budget Vote, National Assembly, Cape Town, 12 June 2013. Available at: <http://www.thepresidency.gov.za>.

²⁴ Flanagan, L. and Rampedi, P., "Zuma wields axe again", The Star, 10 July 2013. Available at: <http://www.iol.co.za>.

²⁵ Donnelly, L. and Faull, L., "Zuma slips into driver's seat", Mail & Guardian, 26 July 2013. Available at: <http://mg.co.za>.

²⁶ "Government dismisses Mail & Guardian's misleading comments on the National Nuclear Energy Executive Coordinating Committee (NNEECC)", Government Communication and Information System (GCIS), 26 July 2013. Available at: <http://www.gcis.gov.za>.

²⁷ See "Who's who in South Africa's nuclear decision-making environment", CAI, August 2012.



Out	In
Deputy President - Kgalema Motlanthe (<i>Chairperson</i>)	President - Jacob Zuma (<i>Chairperson</i>)
Energy Minister - Dipuo Peters	SECRETARIATE: Energy Minister - Ben Martins
Minister in the Presidency - Trevor Manuel	Finance Minister - Pravin Gordhan
High Education and Training Minister - Blade Nzimande	International Relations Minister - Maite Nkoana-Mashabane
Economic Development Minister - Ebrahim Patel	Public Enterprises Minister - Malusi Gigaba
Trade and Industry Minister - Rob Davies	State Security Minister - Siyabonga Cyprian Cwele
Science and Technology Minister - Naledi Pandor (now Derek Hanekom)	Defence & Military Veterans Minister – Nosiviwe Mapisa-Nqakula
Water and Environmental Affairs Minister - Edna Molewa	
NNEECC supported by: NUCLEAR ENERGY TECHNICAL COMMITTEE (Department Director Generals (DG)s of Ministers represented in the NNEECC)	

*Table 1: South Africa's National Nuclear Energy Executive
Coordinating Committee (NNEECC) 2011-2013²⁸*

Significantly, the Trade and Industry Ministry, under which the South African Council for the Non-Proliferation of Weapons of Mass Destruction (NPC) has functioned (as depicted in Figure 1 on the following page), has been removed from Zuma's new NNEECC. Also gone is the Science and Technology Ministry, which invested in a plethora of organisations and forged a number of foreign cooperation agreements aimed at addressing the country's nuclear skills gap.²⁹ The axing of the Water and Environmental Affairs Minister is also curious, as the minister must provide authorisation of several environmental impact assessment (EIA) processes, vehemently opposed on various grounds over the past six year by affected residents and opposition groups, have not yet been finalised. Notable, is that the now-included South African State Security Minister, Dr Siyabonga Cwele, made a statement in June 2011 that the government should "intensify work" over dual-use technologies and that the South African Government's "National Interest Doctrine" considers the commercial competitiveness of such technologies to be as important as its National Security Strategy.³⁰

Zuma appears to have a nuclear policy with opposing objectives

The evolution of Zuma's nuclear policies since being elected as the country's fourth post-apartheid president on 9 May 2009 has been documented in a series of previous reports. The Zuma-led administration's policy inclinations and Cabinet restructuring from 2009 to date has consistently seen Zuma surround himself with like-minded decision-makers on nuclear issues; and has placed some challenges on the country's nuclear sector, notwithstanding the country's consistently growing energy crisis and Zuma's lack of vision.³¹ With only four years of formal schooling, Zuma has so far survived legal prosecution on accounts related to South Africa's arms procurement package during the mid-1990s and scrutiny of his shady business and political associates. Zuma's military background as an underground Commander until 1990 for the then-banned ANC military wing, Umkhonto weSizwe (MK), has also prompted unease about what increasingly appears to be his steering of a nuclear policy with opposing objectives.³² This was evident in remarks made by Zuma at the 2012 Nuclear Security Summit (NSS) in Seoul, when he asserted South Africa's right to enrich uranium "irrespective of the enrichment level" despite global attempts to curb the use of highly-enriched uranium (HEU).³³ Zuma also reiterated South Africa's right to

²⁸ Author's own compilation.

²⁹ See "The status of nuclear-related experts/personalities, 'Madalas', and education in South Africa: Prevailing secrecy coupled with increasing promotion in the industry", CAI, August 2011.

³⁰ Cwele, S., "State Security Budget Vote", 2 June 2011. Available at: <http://www.ssa.gov.za>.

³¹ See "An overview of South Africa's public and private nuclear environment and industry", CAI, May 2009; "The Zuma Administration and nuclear-related policy developments in South Africa: A preliminary assessment", CAI, September 2009; "A selection of key decision makers in the Zuma administration", CAI, December 2010.

³² "South African A Q Khan smugglers down "a nuclear rabbit hole": A potential proliferation risk at a time of increased localised atomic industry expansion", CAI, September 2011.

³³ Fabricius, P., "SA playing both sides of the nuclear coin", Independent Online, 30 March 2012. Available at: <http://www.iol.co.za>.

keep the HEU retained from the apartheid atomic weapons programme, abandoned over 20 years ago, which is now considered a strategic national asset.³⁴ This flouts global aims in favour of international nuclear fuel banks under IAEA safeguards to prevent countries from using HEU as a disguise for weapons development.³⁵ It also coincided with South Africa increasingly siding against superpowers at the United Nations Security Council (UNSC) on the nuclear “rights” of countries like Iran that are presumed to be developing atomic weapons.³⁶ Zuma may likely be considering or working towards the establishment of an international atomic fuel bank on South African soil that would greatly enhance his nuclear stature continentally and internationally. Additionally, Zuma has increasingly strengthened his nuclear co-operation and strategic relationship with Russian President Vladimir Putin who, alongside seeking world domination in the atomic sector, has intensified efforts to rekindle Soviet-era clout in Africa despite the troubling conditional Russian ratification of the Pelindaba Treaty.³⁷ Under Zuma’s rule, NECSA has also established radioactive waste smelter plants at its Pelindaba nuclear complex near Pretoria, despite public opposition on the grounds that South Africa “intends to be an importer of radioactive waste” and thereby undermine the Pelindaba Treaty which prevents radioactive waste dumping in Africa.³⁸

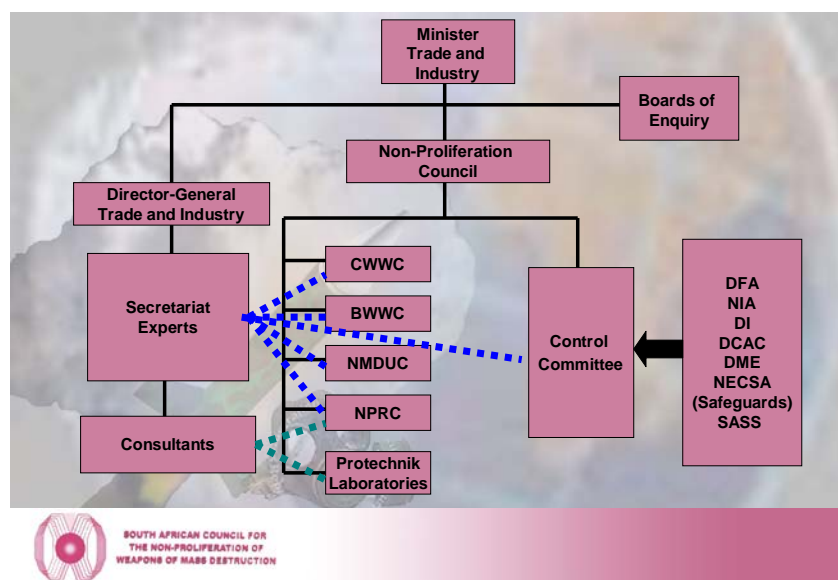


Figure 1: Structure of and relationship between South Africa's agencies and committees focussed on non-proliferation³⁹

³⁴ Fabricius, P., “SA playing both sides of the nuclear coin”, Independent Online, 30 March 2012. Available at: <http://www.iol.co.za>; Kenny, P., “Minty on a mission”, Daily News, 18 April 2012. Available at: <http://www.iol.co.za>; Nuclear Threat Initiative, “Civilian HEU: South Africa”, 28 July 2011. Available at: <http://www.nti.org>.

³⁵ Potter, W. and Mukhatzhanova, G., “Nuclear politics and the Non-Aligned Movement, Adelphi Paper 427”, International Institute for Strategic Studies (IISS), London, 15 February 2012. Available at: <http://www.iiss.org>.

³⁶ See “South Africa’s nuclear relations with Iran”, CAI, November 2012.

³⁷ See “Russia’s nuclear-related connections and intentions in Sub-Saharan Africa (SSA): A new frontier for a nuclear race?”, CAI, March 2012.

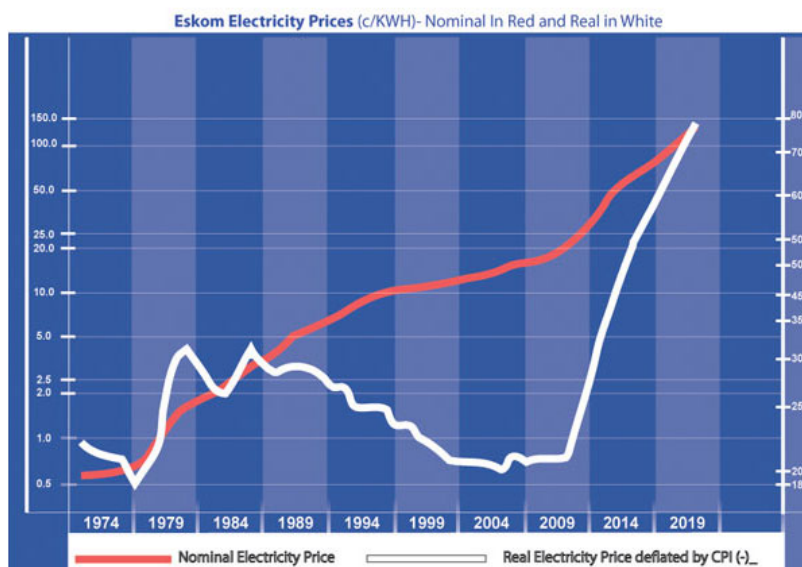
³⁸ “SA a nuclear dumping ground?”, Business iAfrica.com, 26 April 2013. Available at: <http://business.iafrica.com>.

³⁹ “Diagrammatic representation of relationship between the various structures”, South African Council for the Non-Proliferation of Weapons of Mass Destruction (NPC). Available at: <http://www.thedti.gov.za>. Acronyms: Biological Weapons Working Committee (BWWC), Chemical Weapons Working Committee (CWWC), Directorate of Conventional Arms Control (DCAC), Department of Foreign Affairs-Directorate of Disarmament and Non-Proliferation (DFA), Defence Intelligence (DI), Department of Minerals and Energy (DME) (*now separated*), South African Nuclear Energy Corporation - Safeguards Division (NECSA), National Intelligence Agency (NIA), Nuclear and Missile Dual-use Committee (NMDUC), South African Council for the Non-Proliferation of Weapons of Mass Destruction (NPC), Non-Proliferation Review Committee (NPRC) (*legislation*), Non-Proliferation Secretariat (NPS), South African Secret Service (SASS).



The policy upheaval fuels concern about energy security, financial ratings and socio-economic unrest

South Africa's energy policy indecision has fuelled concerns regarding the inability of the beleaguered Eskom to meet peak demand amongst public sector and international experts in, for example, the International Monetary Fund (IMF) and the World Energy Council (WEC). Global credit-ranking agencies such as Moody's and Standard & Poor (S&P) have consistently downgraded Eskom since 2012, cutting the country's sovereign credit and citing deteriorating economic growth that risks social and political tensions, and future political stability of the country. These factors impact on Eskom's access to cost-effective funding. The ratings indicated that Eskom had adequate capacity for its commitments but could be weakened if economic conditions worsened or circumstances changed. Eskom decided to sell more than US\$ 1 billion of debt in the five years through to 2017 to revive old plants and help fund new ones.⁴⁰ And, in April 2013, Eskom had to defer upkeep on nine aging power stations for the duration of the southern African nations' winter months because of higher unplanned outages in summer, prompting concern that there will be insufficient power.



Graph 1: Eskom electricity prices⁴¹

Against a backdrop of increasing power outages since 2008 and trebled electricity costs (as shown in Graph 1 above), South Africa is also experiencing growing labour and social unrest over, among other issues, high unemployment, poor service delivery and the increasing cost of living. Community protests, many of them violent, increased markedly in South Africa in 2012, and showed no signs of abating in the first quarter of 2013.⁴² Consequently, by linking affordable energy to economic growth and stability, South African energy policy analysts warn that unless resolved, the policy discord between various government departments may propel the country towards a general leadership crisis. Additionally, in May 2013, the IMF echoed further warnings that, as Africa's largest economy, South Africa's failure to address its energy infrastructural problems could trigger a pullback of capital flows that will trigger social instability. In addition to this, the country's immediate neighbours are also adversely affected, as countries such as Botswana, Mozambique and Zimbabwe rely on South Africa for their power generation. As South Africa slipped two places to 57 out of 93 members on the WEC's 2012 *Energy Sustainability Index*, the WEC head, Christoph Frei, urged the country to create a single coherent energy policy and to prevent reliance on Eskom so that energy poverty for millions of South African can be avoided.⁴³

⁴⁰ Martinez, A.R., "Eskom plans to sell more than US\$ 1 billion bonds abroad this year", Bloomberg Businessweek, 9 May 2013. Available at: <http://www.businessweek.com>.

⁴¹ "Eskom driving South Africa out of business", MoneyWeb, 24 November 2012. Available at: <http://www.moneyweb.co.za>.

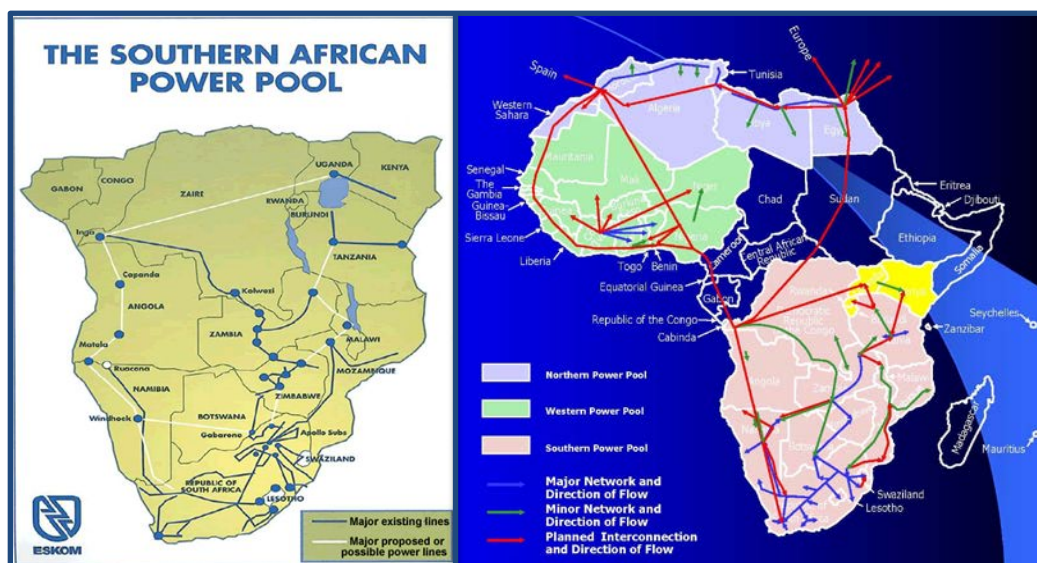
⁴² Salgado, I., "Service delivery protests – a wake-up call for South Africa", Africa Conflict Monthly Monitor, CAI, May 2013.

⁴³ Anderson, A., "South Africa needs coherent energy policy", Business Day, 19 February 2013. Available at: <http://www.bdlive.co.za>.

A brief review of South Africa's ailing state-monopolised power utility, Eskom

Despite plans for a 'super grid' Eskom's transmission infrastructure is on the brink of collapse

While a total collapse of South Africa's electricity system has been avoided since the country's energy crisis started in 2008, power supply constraints were identified as having the potential to slow the country's gross domestic growth outlook.⁴⁴ With a total generation capacity of 41,647 MW, Eskom generates 95% of South Africa's electricity and about 45% of that used elsewhere in Africa.⁴⁵ Despite Eskom's desire to establish a 'super grid' in a regional approach through the dormant Southern African Power Pool (SAPP), outlined in Map 1 below, to boost electricity supply in Sub-Saharan Africa, its transmission infrastructure is precariously on the brink of collapse.⁴⁶



Maps 1 & 2: The South African Power Pool (left) and map (right) depicting existing power pools on the African continent and possible future electricity interconnection⁴⁷

South Africa's fervour to roll-out a fleet of nuclear power stations can, in part, be ascribed to the possibility that the country is determined to retain and grow its standing as a regional powerhouse, granting it sway over its dependant neighbours. Discussion has been underway for some time regarding possible electricity interconnection of Africa's various power pools, as depicted in Map 2 above that was presented in 2005 by the United Nations (UN) Economic Commission for Africa at a seminar on electricity interconnection, hosted by Egypt.⁴⁸ The topic remains under discussion. In October 2013 African policymakers met in Johannesburg, South Africa, for the eight African Economic Conference (AEC) to discuss regional integration, including of power pools, among other issues.⁴⁹

Eskom stands accused of mismanagement and corruption

Eskom and its tardy build programme remain beset with problems and various policy and financial constraints, having hedged its bets on nuclear energy since 1994. Eskom also reels under charges that it is mismanaged, lacks

⁴⁴ "Electricity 2013: A review of South Africa's electricity sector", Creamer Media, 29 January 2013. Available at: <http://www.creamermedia.co.za>.

⁴⁵ O'Flaherty, P., Eskom presentation to the Parliamentary Portfolio Committee on Energy, 21 August 2012.

⁴⁶ "Eskom's power grid on the brink", Reuters, 6 May 2013. Available at: <http://www.iol.co.za>.

⁴⁷ *Ibid.*

⁴⁸ Niyimbona, P., "The challenges of operationalising power pools in Africa", UN Economic Commission for Africa, June 2005. Available at: <http://sustainabledevelopment.un.org>.

⁴⁹ "African policymakers meet to discuss regional integration", Xinhua, 28 October 2013. Available at: <http://www.globaltimes.cn>.



public sector capacity and is marred by corruption, all of which have escalated private-sector calls for an end to Eskom's monopoly on the country's electricity-generating and -distribution sector. For example, Eskom awarded a multi-billion Rand contract to the Hitachi construction firm at Eskom's Medupi Power Station, in which the ANC's investment company, Chancellor House, is a major share-holder. Such contracts involving the ANC "demonstrate the extent to which a political elite has managed to capture decision-making processes around electricity supply," noted a report by the Electricity Governance Initiative of South Africa (EGISA).⁵⁰

Eskom is owed several billion Rand by at least 20 of the country's 184 municipalities;⁵¹ and it is embroiled in a row for providing below-cost tariffs in secret pricing agreements with large industrial consumers.⁵² It also pays large industrial users to shut down during load-shedding.⁵³ Additionally, since 21 February 2013, the country's capacity shortages were compounded by a 900 MW nuclear-powered base-load generator unit being out of service at Koeberg. Simultaneously, a 1,000 MW reduction of power from the Mozambican Cahora Bassa hydro-electric scheme ensued. Eskom had only been able to avoid uncontrolled blackouts by running its diesel-driven open-cycle gas turbines (OCGTs) flat-out during so-called controlled load-shedding by exercising its interruptible contracts to large customers, and paying them to shut down.⁵⁴ Eskom's problems are to be worsened by the controversially sped-up implementation of the National Treasury's announcement in 2013 of a carbon tax policy from 2015. By mid-2013, deep political divisions on the carbon policy erupted in Parliament,⁵⁵ accompanied by growing opposition from business and industry concerned that it would negatively impact the economy.⁵⁶

Eskom holds onto a centralised power system despite pressure for its monopoly on electricity to end

Amid nuclear policy indecision in South Africa and alongside increasing pressure for an end to Eskom's monopoly,⁵⁷ various alternative base-load energy options and renewable-energy projects have surfaced in a flurry of publicity. The entry of independent power producers (IPPs) remains slow, with Eskom deeply concerned about customer migration to new suppliers.⁵⁸ Although South Africa has had policies in place to promote renewable energy since the United Nations Conference on Environment and Development (UNCED) in 1992, they are primarily designed so as not to present a threat to Eskom's centralised power system.⁵⁹

South Africa's public and private nuclear industry forge ahead undeterred by policy upheaval

Necsa is delisted as a public entity and initiates a corporate funding model

Although nuclear plans appear to be back on the drawing board, this has not prevented NECSA from developing nuclear fuel capability and other key infrastructure projects.⁶⁰ Claiming alignment with the NDP, IPAP and several Strategic Integrated Projects (Sips) under the Presidential Infrastructure Coordinating Committee (PICC), NECSA

⁵⁰ "Smart electricity planning report", EGISA, March 2013. Available at: <http://irp2.files.wordpress.com>.

⁵¹ Maphumulo, S., "Eskom owed more than R1 bn for electricity", The Star, 13 March 2013. Available at: <http://www.iol.co.za>.

⁵² "Eskom's deals leave us in the dark", Mail & Guardian, 26 April 2013. Available at: <http://mg.co.za>.

⁵³ Yelland, C., "Eskom – a company in distress...", MoneyWeb, 4 March 2013. Available at: <http://www.moneyweb.co.za>.

⁵⁴ *Ibid.*

⁵⁵ "DA opposes plans to introduce carbon tax", Business Day, 4 June 2013. Available at: <http://www.bdlive.co.za>.

⁵⁶ "SA's leading steel producer gears up for carbon tax battle", Engineering News, 4 June 2013. Available at: <http://www.engineeringnews.co.za>.

⁵⁷ "Monopoly on power must end", Engineering News, 17 May 2013. Available at: <http://www.engineeringnews.co.za>; Fakir, S., "Breaking Eskom's monopoly", The Mercury, 8 May 2013. Available at: <http://72.30.186.176>; Taylor, J., "SA urged to create a competitive electricity market", Engineering News, 5 June 2013. Available at: <http://www.engineeringnews.co.za>.

⁵⁸ Yelland, C., "Eskom – a company in distress...", MoneyWeb, 4 March 2013. Available at: <http://www.moneyweb.co.za>;

"Eskom fears customer migration to new supplier", 17 May 2012. Available at: <http://www.businessday.co.za>.

⁵⁹ "You can't eat electricity", Oxfam, Discussion Paper, May 2013. Available at: <http://us-cdn.creamermedia.co.za>; "Smart electricity planning report", EGISA, March 2013, <http://irp2.files.wordpress.com>.

⁶⁰ NNR & NECSA on their 2013 Strategic Plans to the Energy Portfolio Committee, Parliament, Cape Town, 30 April 2013. Available at: <http://www.pmg.org.za>; NECSA strategic and annual performance plans 2013, Economic Development Committee, Parliament, 11 June 2013. Available at: <http://www.pmg.org.za>.



continues to advance and initiate a strategy for the industrialisation of poorly regulated nuclear technology. NECSA has been classified as a state-owned nuclear research and development facility. Now delisted as a public entity by the Treasury since February 2013,⁶¹ NECSA is initiating its own corporate funding model⁶² as the NECSA Group, with shareholders that include the DoE,⁶³ and off-shore subsidiaries. In May 2013, a state allocation to NECSA of US\$ 160.7 million caused upheaval in parliament's Standing Committee on Appropriations due to energy policy uncertainty and fears of corruption.⁶⁴ In August 2013, NECSA informed the media of a financial turnaround, citing its new corporate structure and austerity measures.⁶⁵

NECSA's newly-stated aim to operate new nuclear power plants appears to compete with Eskom's role, and NECSA's recently declared plan for the "commercialisation of advanced nuclear energy systems" is far from being publicly clear.⁶⁶ What is clear is that as of August 2013, Government no longer considers Eskom to be the sole nuclear plant owner. In a shift from earlier government statements, Energy Director-General Nelisiwe Magubane told a nuclear conference "we are looking at various ownership options for the nuclear power plants, such as an investor or equity partner to join forces with Eskom in the nuclear new build."⁶⁷

Nuclear development grows privately as industry body acts like a quasi-governmental group

Nuclear development is underway by at least two private nuclear companies staffed by apartheid-era government nuclear personnel, involving uranium enrichment processes and a thorium nuclear reactor, at Klydon Proprietary Limited and Steenkampskraal Thorium Limited (STL), respectively.⁶⁸ Additionally, a senior NECSA official was seconded to be Managing Director of the private Nuclear Industry Association of South Africa (NIASA) in an ongoing joint 'sister organisation' arrangement, in order for NIASA to build a team to advance nuclear power in South Africa.⁶⁹ NIASA, which incorporates several foreign nuclear build companies (some of them foreign state-run), increasingly acts as a quasi-governmental group.⁷⁰ Thus, the line of state controls of the country's nuclear industry is increasingly unclear. Added to this, parliamentary briefing notes of 11 June 2013 on the annual performance plans of the National Nuclear Regulator (NNR), which is a public entity, state that it is "struggling financially", and thus, its adequacy is compromised.⁷¹ Regardless that the country's energy roadmap has not been finalised, and despite many unanswered questions about privatised atomic companies in South Africa, the IAEA has strongly endorsed a key role for South Africa as both a recipient and donor of nuclear technology on the African continent. This is a boost likely to advance the government's nuclear drive and its nuclear industrialisation strategy, despite policy delays, outstanding public participation processes and domestic objections.

⁶¹ "Public Finance Management Act: Delisting of public entities: SA Nuclear Energy Corporation", Government Gazette, 13 March 2013. Available at: <http://www.info.gov.za>.

⁶² *Ibid.*

⁶³ Department of Energy Annual Report 2012/2013, 30 September 2013. Available at: <http://www.gov.za>.

⁶⁴ Appropriation Bill: Public hearings, Standing Committee on Appropriations, Parliament, 31 May 2013. Available at: <http://www.pmg.org.za>.

⁶⁵ Campbell, K., "NECSA cancels retrenchments in light of turnaround", Engineering News, 16 August 2013. Available at: <http://www.engineeringnews.co.za>.

⁶⁶ NECSA strategic and annual performance plans 2013, Economic Development Committee, Parliament, 11 June 2013. Available at: <http://www.pmg.org.za>.

⁶⁷ Speech by Nelisiwe Magubane, Director-General of Energy, to the Nuclear Industry Association of South Africa (NIASA) Convention in Port Elizabeth, 14 August 2013. Available at: <http://www.info.gov.za>.

⁶⁸ Klydon (Pty) Limited website, <http://www.klydon.co.za>; Steenkampskraal Thorium Limited website, <http://www.thorium100.com>.

⁶⁹ "NECSA's Msebenzi seconded to NIASA as MD", Engineering News, 12 June 2013. Available at: <http://www.engineeringnews.co.za>.

⁷⁰ NIASA letter to members on "Building a South African team to advance nuclear power", 12 June 2013.

⁷¹ Brief notes on the annual performance plans for the NNR and NECSA, Author's collection, 11 June 2013.



Nuclear pacts continue despite no finalisation of South Africa's energy policy

Adding to the apparent contradiction of the NNEECC's intended cohesive strategy to "ensure the coordination and alignment of all government stakeholders in the nuclear energy programme," as outlined by former Energy Minister Dipuo Peters in June 2013,⁷² several new nuclear pacts have emerged. In October 2013, US nuclear company Westinghouse Electric South Africa announced that it had signed a Memorandum of Understanding (MoU) with a black economic empowerment procurement and engineering company, Sebata Group of Companies, "in preparation for the potential construction of Westinghouse nuclear power plants in South Africa."⁷³ Sebata is not a previously known nuclear sector stakeholder in South Africa. The Westinghouse statement also noted that it had signed a hitherto publicly-unknown agreement with NECSA to "investigate and cooperate in the development of local fabrication capabilities for fuel assembly components."⁷⁴

In August 2013, the DoE placed on public record that the South African Government "currently has a number of bilateral agreements on peaceful uses of nuclear energy with a number of countries across the globe."⁷⁵ Curiously, although the DoE mentioned Algeria, Argentina, China, the European Atomic Energy Community (EURATOM), Russia, South Korea and the United States (US), there have been many more nuclear or energy-related agreements between South Africa and various other countries that seem to have been omitted from the statement. For example, 92 cooperation agreements in terms of a Joint Bilateral Commission (JBC) Iran that encompass, among others, cooperation in science and technology, scientists and science student exchanges, defence, electricity and mining (including beneficiation), reform of existing global and governance structures, and nuclear issues, according to the Iranian Embassy.⁷⁶ In October 2013 officials stated that South Africa was in the process of terminating 'old-generation' - predominantly European - bilateral investment treaties (BITs) in favour of BITs with the BRICS (Brazil, Russia, India, China, South Africa) grouping which World Trade Institute's Dr Stephen Gelb warned would impact investor confidence in the country.⁷⁷

Executive ANC members' envision South Africa as a 'nuclear power' in a new world order

South Africa's nuclear programme has been driven by executive members in the ANC who regard the country as a 'nuclear power'. Irrespective of the domestic political furore sparked by the NPC's findings against a nuclear option, Zuma's ongoing foreign policy initiatives to ensure that nuclear expansion becomes a South African reality, and an African leader, have accelerated. Additionally, the South African Government has leveraged its position in recent years within numerous multilateral organisations such as, for example, the African Union (AU), the New Partnership for Africa's Development (NEPAD), the UN and particularly the BRICS economic grouping.

BRICS was formed to create a new global order as a counterweight against Western preponderance, and has been of particular importance to South Africa as BRICS members together yield considerable influence on nuclear issues, as members of the IAEA Board of Governors. Additionally, BRICS includes nuclear and defence cooperation, and also anticipates special privileges in terms of the Nuclear Suppliers Group (NSG), a nuclear export control regime.⁷⁸ Collectively, BRICS countries are emerging as the fastest growing within the nuclear industry, estimated by a

⁷² Speech by the Minister of Energy, Dipuo Peters, on the occasion of the youth round-table on nuclear energy, Cape Town, 13 June 2013. Available at: <http://www.energy.gov.za>.

⁷³ Westinghouse Electric Company press release, "Westinghouse announces strategic agreement with leading South African engineering company", PR Web, 24 October 2013. Available at: <http://www.prweb.com>.

⁷⁴ *Ibid.*

⁷⁵ Department of Energy statement on the new nuclear build, South African Government Information, 1 August 2013. Available at: <http://www.info.gov.za>.

⁷⁶ "South Africa's nuclear relations with Iran", CAI, November 2012.

⁷⁷ Kolver, L., "SA proceeds with termination of bilateral investment treaties", Engineering News, 21 October 2013. Available at: <http://www.engineeringnews.co.za>.

⁷⁸ "South Africa's nuclear relations with Iran", CAI, November 2012.



market research study to have a total market value of US\$ 12.2 billion in 2012.⁷⁹ How this will impact Africa's nuclear development, as well as the evolving challenge to the NPT and nuclear non-proliferation risk in South Africa and on the African continent has yet to be seen. Egypt, Iran, Nigeria, Syria and Venezuela have all made known their interest in joining BRICS.

South Africa is placing African development ahead of its national agenda

South Africa appears to be placing the development of Africa ahead of its national agenda instead of first solidifying its own economy. Justifying this view, former Minister Essop Pahad maintains that South Africa requires a continental approach and “needs to get out of a national sovereignty mindset” which, Pahad concedes, “people might not find palatable.”⁸⁰ However, resentment exists in Africa about South Africa's role as Africa's self-acclaimed spokesman and ‘gateway’ for the BRICS partnership,⁸¹ and to this end it might be walking “a political tightrope.”⁸² Additionally, several African states are continuing to advance their own atomic energy plans, jostling for continental prominence to attract investors.⁸³ Ultimately, nuclear envy is a likely outcome in the battle for atomic investors and could lead to conflict that will test commitment to nuclear non-proliferation.

Concluding remarks

Policy discord and vacillations on South Africa's energy future, and more specifically the inclusion of nuclear energy in its future energy mix, hold significant risks for social and political tensions and the country's future political stability. Eskom has been mismanaged for over a decade and the country's electricity sector is in trouble, exacerbated by the fact that the politics surrounding it are not healthy. The South African Government's energy policy is faced with increasing opposition from within its ranks. Regardless, South Africa's public and private nuclear industry seems to be forging ahead as if independent and beyond reproach. Despite plans being reviewed, Zuma has accelerated efforts to pursue foreign policy pacts that pave the way for the much-vaunted nuclear roll-out. Considering the failure of the South African Government to deal effectively with its own energy crisis, it is probable that Zuma's nuclear agenda is aimed at entrenching South Africa as a regional powerhouse with sway over its dependent neighbours while enhancing his stature continentally and internationally as a global nuclear power.

With atomic power appearing to be strongly about South Africa's foreign policy rather than domestic energy supply, Zuma appears to be risking a leadership crisis by riding roughshod over his country's muddled energy policy and supply problems. Of equal concern is that NECSA and private ‘sister’ groups appear to be dictating strategies to Parliament without policy decisions being finalised.

Meanwhile, IPPs and renewable energy projects are gearing up and may fill the country's energy-supply gap – however, the latter may be constrained by government policy to protect Eskom's monopoly. An inherent danger exists that NECSA will seek to become a state-owned IPP and that with diminished state control, its intended atomic fuel-cycle may become as mismanaged as Eskom is. Such a scenario is likely to hold significant risks for South African and global nuclear non-proliferation.

⁷⁹ “Nuclear energy – BRIC industry guide”, Fast Market Research, SBWire, 10 August 2013. Available at: <http://www.sbwire.com>

⁸⁰ Odendaal, N., “SA urged to put Africa agenda first”, Engineering News, 1 November 2013. Available at: <http://www.engineeringnews.co.za>.

⁸¹ Frazer, J., “Resentment as South Africa speaks business for the continent”, South African Foreign Policy Initiative (SAFPI), 12 March 2013. Available at: <http://www.safpi.org>.


⁸² *Ibid.*


⁸³ “Sub-Saharan Africa's nuclear ambitions”, CAI, October 2011.



Produced by Consultancy Africa Intelligence (Pty) Ltd

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