



Proposed Speech
Mr Loyiso Tyabashe, Acting General Manager: New Nuclear Build
Nuclear Regulatory Information Conference
16 May 2018

“Lessons learnt from megaprojects – Eskom new build programme”

Industry associates, experts, and leaders

All stakeholders present

Distinguished guests

Ladies and gentlemen

Good morning

It is a great honour and privilege for me to address this auspicious gathering in the presence of industry experts, associates, leaders, and partners in the energy industry from around the globe.

From the 15 billion US dollar Sellafield nuclear site in England to the 350 000 acre Great Man-Made River project in Libya, megaprojects around the world – like wild beasts – are difficult to tame. Closer to home, Eskom’s capital expansion plan to expand both the generation and transmission infrastructure is no exception. It is the largest capital expenditure programme in Africa, and on completion, it will increase South Africa’s generating capacity by 17 384 MW.

Eskom operates 30 power stations, with a total nominal capacity of over 45 000 MW, comprised of 38 672 MW of coal-fired stations; 1 860 MW of nuclear power; 2 409 MW of gas-fired electricity; 2 724 MW of pumped-storage facilities; and 661 MW of hydro stations as well as a 100 MW wind farm.

Eskom also transmits and distributes power to customers, with approximately 384 712 km of cables and power lines.



Ladies and gentlemen, I would like to begin by giving an overview of our key megaprojects and their operational highlights and areas for improvement. One of these is the construction of Medupi Power Station, a greenfield coal-fired power plant project located west of Lephalale, Limpopo. Medupi (4 800 MWe) was built almost 20 years after Eskom's last coal project, which was Majuba.

To date, for Medupi, three units (each with 800 MW gross output) at Medupi have been connected to the national grid and put into commercial operation, adding 2 382 MW to the total 4 800 MW installed capacity. The fourth unit was synchronised to the national grid on 8 April 2018. Commercial operation is expected before the end of the 2018/19 financial year, ahead of the revised schedule.

Kusile is another megaproject that is located in the Nkangala district of Mpumalanga. Kusile (4 800 MWe) will be the fourth-largest coal-fired power station in the world once completed. It employs cutting-edge technology in the form of flue-gas desulphurisation (FGD). FGD is used to remove oxides of sulphur, such as sulphur dioxide, from exhaust flue gases in power plants that burn coal or oil. This is one of the climate change emission abatement mechanisms to ensure compliance with air-quality standards. The first unit at Kusile reached commercial operation on 30 August last year, adding 799 MW to the national grid. Kusile Unit 2 was synchronised to the national grid on 24 March this year. Commercial operation of this unit is expected before the end of the 2018/19 financial year.

On the list of our massive projects is the construction of Ingula Pumped-Storage, which is beyond doubt a success story. All four units of Ingula are now in commercial operation, adding 1 332 MW of peaking power. The Ingula project won two prestigious awards at the annual South African Institute of Civil Engineering (SAICE) and South African Forum of Civil Engineering Contractors (SAFCEC) awards, for most outstanding civil engineering and technical excellence achievements.

Our megaprojects are also comprised of the expansion of high-voltage transmission lines and substation capacity. In the last few financial years, we have added at least 700 km of these HV lines and 2 500 MVA of substation capacity per year.



Our new build programme, like any other project of this magnitude, involves large-scale investments and presents both significant challenges and opportunities. For our country, which is facing socio-economic challenges underlined by poverty and unemployment, this programme serves as a beacon of hope. Thus, over and above the pressing objective to timeously deliver quality projects within approved resources such as budget and time, the social impacts of the projects take centre stage. This resonates with Eskom as an organisation that has placed people at the heart of its operations throughout its more than nine decades of existence.

Through these megaprojects, efforts are being intensified, while ensuring alignment with government's economic policy and the call to enhance the living conditions of our communities. Supplying electricity and enabling South Africa's economic objectives are Eskom's mandate and are appropriate for a state-owned company. Considering that over 50% of the country's population live below the poverty line and that about 27% of people are unemployed, relieving this plight of South Africans becomes even more of a compelling need.

It gives me pleasure to highlight the social impact our megaprojects have had on our communities. At the peak of construction, Medupi created more than 18 000 direct jobs. The town of Lephalale's gross domestic product (GDP) increased by approximately 95% per year as a result of construction activities. To ensure sustainable development for the long-term benefit of our communities, Eskom launched the Medupi Leadership Initiative (MLI) in 2013. The MLI is primarily aimed at seeking sustainable solutions to improve peoples' lives around the Medupi construction project, mainly through job creation. Over the years, MLI's focus has evolved to enable self-employment opportunities for locals through SMMEs, enterprise development, smallholder farming, and drylands. The programme has been a resounding success. To date, over 152 SMMEs have been registered on the MLI database, and 21 SMMEs are currently in the incubation process in the Lephalale Enterprise Development Centre. In addition, approximately 18 000 hectares of land has been restored to productive use in traditional areas and D'Nyala Nature Reserve. This is a significant contribution to land redistribution, which is one of the government's key priorities. The drylands project has also revitalised school gardening initiatives at 185 schools, enabling the provision of more than 37 200



nutritious meals to children. The MLI is the first project of this nature and scale to be undertaken in the South African construction industry.

In the same line of enabling self-sustainability, Eskom also launched the Contractor Academy at Medupi in 2007, with the aim of supporting government in skills and infrastructure development, job creation, and poverty alleviation. The Academy equips emerging contractors with the requisite business management skills to grow sustainable businesses. To date, 1 147 students have been trained, achieving a 97% pass rate. The Academy has had a huge impact on many small businesses. Contracts worth R2.78 billion have been awarded by Eskom to contractors who have completed the Academy's training.

Ladies and gentlemen, still on the social upliftment drive, our communities have reaped and continue to reap rewards from the Kusile construction project. Eskom prioritised job creation in the construction of this site, and at its peak, more than 19 000 direct jobs were created. The region where Kusile is located is realising a projected 25% increase in GDP per year. The Kusile project includes skills development programmes, which are part of its contractual obligations to suppliers. The programmes target critical skills such as boilermaking, mechanical pipefitting, coded welding, and engineering. So far, 2 950 young people have been trained, and the majority of them are working for the various contractor partners.

Furthermore, through the Eskom Development Foundation and through collaborative partnerships, over R100 million has been invested through corporate social investment support programmes addressing specific developmental needs – from enterprise development to education and health care. These investments include R34 million towards building Sibongindawo Primary School, in partnership with Alstom, R10 million for the renovation of Sibukosethu Primary School in Phola, the building of a police station to the value of R5.5 million, and R4 million towards the purchase and installation of water reservoirs for the Witbank provincial hospital, among many other projects.



Ladies and gentlemen, these are but a few practical examples of the positive impact of our capital projects on our communities, while also contributing to the advancement of the country's National Development Plan (NDP).

On top of their social and economic benefits, our projects have had a huge environment impact. As it was a case of dealing with the people aspect, this proved to be a manageable task. In line with both this principle and the government's environmental management policy, the physical environment had to be adequately appraised, ensuring that no wildlife was intentionally harmed in the process of constructing our power plants, lines, and other structures. Eskom now manages about eight thousand hectares of expansive mountainous grassland, including around one thousand hectares of sensitive wetland. We also operate two nature reserves at Ingula and Koeberg. Ingula Nature Reserve, which is operated in partnership with BirdLife South Africa and the Middelpunt Wetland Trust, is home to more than 300 bird species, including South Africa's national bird, the blue crane. To showcase the amazing fauna and flora in this beautiful landscape, we host an annual bird walk, an event that you are all welcome to join.

Still on the environmental impact of our megaprojects, unique to the South African context with its diverse, multicultural population and rich history, we faced a peculiar and difficult situation where we had to negotiate the relocation of graves to make way for the Medupi construction project. Eskom unveiled a commemorative plaque and had a traditional cleansing ceremony in memory of those who had been laid to rest at the site where the Medupi power station is currently being constructed.

In addition, the safety of our people remains a key priority, through our Zero Harm value. Our safety performance is within acceptable standards. However, we have also had our fair share of painful moments in terms of safety performance, which we wish we could erase from the history of the organisation. One of the most painful moments was the loss of six employees at our Ingula construction site in 2013, when a working platform collapsed, also leaving several others injured.

Ladies and gentlemen, despite the positive impact of the projects in terms of job creation, skills development, and investment in the community through corporate



social investment, we have also experienced key challenges. At the centre of these challenges was cost escalation due to inadequate front-end planning at the inception of the projects for both Medupi and Kusile. It is important to pause and reflect on this point. It is well documented that South Africa's energy policy decisions that excluded Eskom from building new generation capacity in the late 1990s led to us having to go into building megaprojects as quickly as possible, with very little planning time. This then led to problems arising midway, impacting time and project costs. The cost of Medupi has increased from R105 billion to R145 billion, while for Kusile, the cost has risen from R118.5 billion to R161.4 billion (although public, this figure is still to be audited.) Inadequate contractor capacity has also contributed to additional cost overruns at these capital projects. This is contrary to the popular belief that contractors will always be far ahead in terms of knowledge and skills. Close management has had to be the order of the day for successful implementation. The instability often experienced at the construction sites remains a Priority 1 risk. Talking of instability, apart from strike settlements by employees from our contractor partners, we have seen the emergence of social formations demanding job and business opportunities. In many cases, these developments are politically motivated. Other foremost considerations include time for environmental authorisation and land acquisition for both power plant and transmission projects.

Ladies and gentlemen, we have learnt a great deal from these key challenges and experiences and are ready to improve on future build projects. We have created risk-adjusted schedules to provide a more realistic view of schedules and funding and continue to focus on bringing new capacity from these power projects on line.

Ladies and gentlemen, my talk would not be complete without touching on the nuclear programme, even though its physical execution has not commenced. Global energy trends point to a diversified energy mix, including renewable power and nuclear power. According to the International Energy Agency, the World Energy Outlook New Policies Scenario expects an estimated 46% increase in nuclear power production around 2040. There are currently 59 nuclear reactors under construction around the world, the process being led by China, Russia, and India, closely followed by Korea and the United Arab Emirates. Key lessons from these cross-border projects are being integrated, taking into consideration that there will be



geographically specific issues when the South African programme gets under way in earnest.

Having said this, as Eskom (South Africa's owner, operator, and procurer of the new nuclear build), we eagerly await the finalisation of South Africa's Integrated Resource Plan (IRP) for South Africa's plans in terms of nuclear power. Regarding the envisaged nuclear projects, the added requirements of the National Nuclear Regulator (NNR) are a necessity due to the type of technology at hand. To this end, Eskom has applied to the National Nuclear Regulator (NNR) for two nuclear installation site licences for the Thyspunt site in the Eastern Cape and the Duynefontein site in the Western Cape and is expecting the Regulator's decision in the near future. As you are all aware, Thyspunt was recommended by the environmental impact assessment (EIA) as the preferred site for installation of the new nuclear reactors, but the decision of the Department of Environmental Affairs designated Duynefontyn as the site for hosting the next nuclear reactors. The current process is in the appeal stage, where the applicant (Eskom) has to respond to the appeals lodged with the Department of Environmental Affairs (DEA).

The NNR is assessing the suitability of both sites to accommodate a nuclear installation in accordance with NNR requirements. This process entails following its internal and external processes of verification of the application and the supporting documentation (for example, the site safety report, or SSR). We are also aware that international regulatory experience on siting and build projects will be fed into the review process. It is our hope that robust and agile systems will be adopted for acceptance of safety cases.

As I conclude, I would like to emphasise that Eskom is cognisant of its role in achieving the Sustainable Development Goals, particularly Goal 7, that of ensuring access to affordable, reliable, sustainable, and modern energy for all. We are fully aware of our strategic contribution to the country's National Development Plan (NDP). At Eskom, we know that, as the country's largest electricity supplier, we need to meet the targets promulgated by the Department of Energy in strategic blueprints such as the Integrated Energy Plan (IEP) and the Integrated Resource Plan (IRP). We are aware that, in order to fulfil our mandate of electricity generation, distribution,



and transmission towards reliable electricity provision, we need to invest in sound infrastructure, thus creating an enabling environment for a prosperous future for our country. Eskom understands that it cannot do this alone. This can only be achieved through a strong collaborative approach in the marketplace, streamlined regulatory processes, and meticulous planning.

I wish the conference participants well in the discussions to follow as we pursue lasting solutions for the energy industry to the benefit of all South Africans, as well as the global village.

I thank you.