



CONSULTATION PAPER

CONCURRENCE WITH THE MINISTERIAL DETERMINATION ON THE PROCUREMENT OF 2 500MW GENERATION CAPACITY FROM NUCLEAR

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DEFINITIONS

In this consultation paper, any word or expression to which a meaning has been assigned, shall have a meaning so assigned and, unless the context otherwise indicates.

‘buyer’ means, in relation to a new generation capacity project, any organ of state designated by the Minister of Mineral Resources and Energy in terms of section 34(1)(c) and (d) of the Electricity Regulation Act, “the Act”. In this regard the buyer is Eskom.

‘Cost of Unserved Energy’ is the value (in Rand per kWh) that is placed on a unit of energy not supplied due to an unplanned outage of short duration. The COUE values are important parameters in the Electricity Supply Industry because they allow the network planners and different business sectors to make informed estimates as to whether it is worthwhile to experience load-shedding or to put measures to mitigate it.

‘Base Load Generation’ means the generating facilities within a utility system, which are operated to the greatest extent possible to maximise system mechanical and thermal efficiency and minimise system operating cost. Typical example is the coal power station.

‘Eskom’ means Eskom Holdings Limited contemplated in section 3(1) of the Eskom Conversion Act, 2001 (Act No.13 of 2001).

‘generator’ means a person who generates electricity.

‘Government’ means the Government of the Republic of South Africa.

‘Independent Power Producer’ means any person in which the Government or any organ of state does not hold a controlling ownership interest (whether directly or indirectly), which undertakes or intends to undertake the development of new generation pursuant to a determination made by the Minister of Mineral Resources and Energy in terms of section 34(1) of the Act.

‘Minister’ means the Minister of Mineral Resources and Energy.

‘new generation capacity’ means a project for the development of new generation capacity pursuant to a determination made by the Minister in terms of section 34 of the Act.

‘organ of state’ bears the meaning ascribed to it in section 239 of the Constitution.

‘power purchase agreement’ means an agreement concluded between a generator and the buyer for the sale and purchase of new electricity generation capacity or electricity derived therefrom, or both.

‘procurer’ means the person designated by the Minister in terms of section 34 of the Act as being responsible for the preparation, management and implementation of the activities related to procurement of new generation capacity under an IPP procurement programme including the negotiation of the applicable power purchase agreements, which person may or may not be a buyer.

‘the Act’ means the Electricity Regulation Act, 2006 (Act No. 4 of 2006).

ABBREVIATIONS AND ACRONYMS

COUE	Cost of Unserved Energy
ESI	Electricity Supply Industry
DMRE	Department of Mineral Resources and Energy
IPP	Independent Power Producer
IRP	Integrated Resource Plan
MW	Megawatts
MYPD	Multi-Year Price Determination
NERSA	National Energy Regulator of South Africa
OCGT	Open Cycle Gas Turbine
RAB	Regulated Asset Base
RFI	Request for Information
RFP	Request for Proposal
SMR	Small Modular Reactor
WUC	Work Under Construction

EXECUTIVE SUMMARY

The National Energy Regulator of South Africa (NERSA) is a regulatory authority established as a juristic person in terms of section 3 of the National Energy Regulator Act, 2004 (Act No. 40 of 2004). NERSA's mandate includes regulation of the Electricity Supply Industry.

In accordance with section 34 of the Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act'), the Minister of Mineral Resources and Energy ('the Minister') may, in consultation with the Energy Regulator:

- a) determine that the new generation capacity is needed to ensure the continued uninterrupted supply of electricity;
- b) determine the types of energy sources from which electricity must be generated, and the percentages of electricity that must be generated from such sources;
- c) determine that the electricity thus produced may only be sold to the persons or in a manner set out in such notice;
- d) determine that electricity thus produced must be purchased by the persons set out in such notice; and
- e) require that new generation capacity must –
 - i. be established through a tendering procedure which is fair, equitable, transparent, competitive and cost-effective;
 - ii. provide for private sector participation.

The Minister has determined to commence the process to procure the new nuclear energy generation capacity of 2 500MW as per decision 8 of the Integrated Resource Plan for Electricity 2019 to 2030 (published as GN 1360 of 18 October 2019 in Government Gazette No. 42784) (IRP 2019). The determination is also attached hereto as **Annexure A**.

In performing its mandated functions, NERSA is required to ensure that the following objects set out in the Act are achieved:

- i. The efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa.
- ii. The interests and needs of present and future electricity customers and end-users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic.
- iii. Investment in the electricity supply industry is facilitated.
- iv. Universal access to electricity is facilitated.
- v. The use of diverse energy sources and energy efficiency is promoted.
- vi. Competitiveness and customer and end-user choice are promoted.

Furthermore, in making its decision NERSA must satisfy the provisions of the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000) (PAJA). It is based on the above that NERSA requires to undertake a public participation process for the concurrence with this determination, which enables it to appropriately apply its regulatory views and decision-making prior to concurrence with the ministerial determination.

In satisfying the concurrence process in accordance with section 34 of the Act, NERSA is requesting stakeholders to comment on the new generation capacity of 2 500 megawatts (MW) to be procured from nuclear, as set out in this consultation paper. The comments should be addressed to: **Mr Dennis Seemela at the National Energy Regulator of South Africa, Kulawula House, 526 Madiba Street, Arcadia, Pretoria, 0083; or emailed to irp-procurement.newcap@nersa.org.za; or posted to PO Box 40343, Arcadia, Pretoria, 0007, South Africa.**

The deadline for the submission of comments is 5 February 2021.

Kindly provide the name, address, telephone number, fax number and email address of the person or organisation submitting the comments. Submissions made after the deadline will not be considered.

Following the closure of the period for the submission of written comments, NERSA will host public hearings through online platforms that will include live streaming in order to reach as many stakeholders as possible. Stakeholders are therefore requested to indicate, when they provide their written comments, their interest to make oral representation to the Energy Regulator at the public hearings that will follow in due course and will be duly communicated.

NERSA will then collate all comments received, including oral presentations, which will be taken into consideration when the decision to concur with the Ministerial Determination is made.

1. BACKGROUND

Certain provisions of the Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act') require participation of the National Energy Regulator of South Africa (NERSA) in policy implementation and as a result of the supply constraints and to comply with the declarations and protocols, the Republic of South Africa has signed under the tutelage of the United Nation. The implementation of policies in terms of section 34 of the Act requires NERSA to appropriately apply its regulatory reviews and to make a decision prior to the conclusion of the determination process by the Minister of Mineral Resources and Energy ('the Minister'). It is incumbent on NERSA when making its decision to ensure that it complies with applicable laws, which include the National Energy Regulator Act, 2004 (Act No. 40 of 2004) ('the National Energy Regulator Act'), and any appropriate procedure to clothe the process with legal certainty.

On 6 August 2020, NERSA received a proposed determination from the Minister in terms of section 34 of the Act, attached hereto as **Annexure A** and also detailed below:

1. To commence the process to procure the new nuclear energy generation capacity of 2 500MW as per decision 8 of the Integrated Resource Plan for Electricity 2019 – 2030 (published as GN 1360 of 18 October 2019 in Government Gazette No. 42784) (IRP 2019).
2. The generator of this electricity produced will be Eskom Holdings (SOC) Limited, or any other organ of state, or in partnership with any other juristic person.
3. The buyer of the electricity will be Eskom Holdings (SOC) Limited or any entity determined through the Eskom's unbundling process as the future buyer of electricity.

4. The procurer of the nuclear new build programme will be the Department of Mineral Resources and Energy, or any other organ of state, or in partnership with any other juristic person.
5. The procurer designated above will be responsible for determining the procurement process, which will be established through a tendering procedure that is fair, equitable, transparent, competitive and cost-effective.

NERSA has not yet formulated any opinions on the issues that are raised in this consultation paper, but is raising them so that stakeholders can give their opinions and input on these issues in order to assist NERSA to make a well-considered decision.

2. CAPACITY ALLOCATION

The IRP 2019 gazetted on 18 October 2019 tables the planned capacity up to 2030 in **Table 1** below, it also indicates in **Decision 8** of the report the following:

Commence preparation for a nuclear build programme to the extent of 2 500MW at a pace and scale that the country can afford because it is a no-regret ¹option in the long term.

¹ No-regret option is not defined in the IRP 2019, however here it is assumed to mean those options that generate net social or economic benefits irrespective of whether or not climate change occurs, as well as across a range of possible climate futures. They build resilience to future climate shocks while also delivering near-term benefits.

Table 1: The IRP 2019 to 2030 results

	Coal	Coal Decomm	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (DG, CoGen, Biomass, Landfill)
Current Balance	37 149		1 860	2 100	2 912	1 474	1 980	300	3 830	499
2019	2 155	-2 373					244	300		Allocation to the extent of the short term capacity and energy gap
2020	1 433	-557				114	300			
2021	1 433	-1 403				300	818			
2022	711	-844			513	400	1 000	1 600		
2023	750	-555				1 000	1 600		500	
2024			1 860				1 600	1 000	500	
2025						1 000	1 600		500	
2026		-1 219					1 600		500	
2027	750	-847					1 600	2 000	500	
2028		-475				1 000	1 600		500	
2029		-1 694			1 575	1 000	1 600		500	
2030		-1 050		2 500		1 000	1 600		500	
Total Installed by 2030 (MW)	33 364		1 860	4 600	5 000	7 288	17 742	600	6 830	
% Total Installed Capacity (% of MW)	43		2,36	5,84	6,35	10,52	22,53	0,76	8,1	
% Annual Energy Contribution (% of MWh)	58,8		4,5	8,4	1,2	6,3	17,8	0,6	1,3	
	Installed Capacity									
	Committed / Already Contracted Capacity									
	Capacity Decommissioned									
	New Additional Capacity									
	Extension of Koeberg Plant Design Life									
	Includes Distributed Generation Capacity for own use									

The IRP 2019 further indicates that due the capacity from coal to be decommissioned post 2030 and the end of design life of Koeberg nuclear power plant, additional nuclear capacity at a pace and scale the country can afford is a no-regret option for the country.

South Africa is currently facing load-shedding, which is primarily driven by the declining coal fleet's plant performance since 2008 and over-reliance on Open Cycle Gas Turbines (OCGTs). Load-shedding not only resulted in a loss of security of electricity supply to the country, but it also costs sectors of the economy billions of Rands and leads to job losses as electricity is an economic enabler. The procurement of 2 500MW from nuclear power will increase the nuclear contribution to the country energy mix from 2.4% to 5.6%, see **Table 1** above, which is lower than any other capacity allocation except for the concentrated solar power (CSP).

This base load capacity will also create much needed reserve margin on the system as the plant performance data of Eskom's power plants has shown, on many

occasions, that the system is running with negative reserves. The average annual electricity demand is expected to grow by 1.8% in 2030 and 1.4% in 2050 (~377TWh), based on the median forecast scenario in the IRP 2019.

Table 1 further gives an indication of the coal capacity that will be decommissioned from Eskom's coal power stations. More precisely, 5 732MW will be decommissioned by 2023. This will increase to 11 017MW by 2030. Post 2030, the expected further decommissioning of 24 100MW of coal power stations supports the need for additional capacity from cleaner energy technologies, including nuclear.

The impending loss of base load capacity will result in a base load gap in the energy mix beyond 2030, which has several unintended consequences from a system stability perspective e.g. loss of inertia in the system and need for more ancillary services. In light of the above-mentioned factors, the Department of Mineral Resources and Energy (DMRE) developed procurement of 2 500MW of nuclear within a diverse supply scenario, in order to maintain supply-demand balance in the future and improve energy security. In considering the procurement of this new capacity, the capacity must be tested against the system needs in the proposed time horizon as well as the objects of the Act in terms of the sustainability of the industry, affordability and the use of diverse energy sources.

A. To commence the process to procure the new nuclear energy generation capacity of 2 500MW as per decision 8 of the Integrated Resource Plan for Electricity 2019 – 2030 (published as GN 1360 of 18 October 2019 in Government Gazette No. 42784) (IRP 2019).

Questions

1. Is this 2 500MW of nuclear capacity section 34 determination compliant with the IRP 2019 as gazetted by the Minister of Mineral Resources and Energy?
2. In light of the decommissioning of a significant amount of base load capacity by 2030, and South Africa's reliance on natural resources extraction and beneficiation as significant drivers of economic development, should this base

- load capacity be added post 2030 and why? Is this an important consideration in the broader integrated industrial policy and why?
3. What other base load options are available that the country could invest in? Justify the preferred option?
 4. Comment on the type of technology in the determination in line with the following:
 - i. Energy security² considering both security of supply and security of demand.
 - ii. Efficient, effective, sustainable and orderly development and operation of the electricity supply industry from production through to consumption.
 - iii. The interest of present and future electricity customers is safeguarded against, inter alia, stranded assets, environmental impact and energy security.
 - iv. Use of diverse energy sources and energy efficiency.
 - v. International best practices.
 - vi. Mitigation of climate change by the reduction of greenhouse gases and other environmental imperatives.
 5. Provide what you consider to be the risks and challenges associated with the allocated capacity in terms of the objects of the Electricity Regulation Act mentioned in question 3 above.
 6. Comment on the lead time for the deployment of nuclear power plant of circa 10 years, from design, licensing, construction and commissioning.
 - i. Considering the lead time above, what would be the most suitable time to commence preparations if nuclear was to be a no-regret option to replace the base load capacity to be decommissioned post 2030?
 7. What would be the advantages brought about by SMRs, and is it possible for these to complement intermittent technologies such as renewables?
 8. Comment on the impact of nuclear technology on the electricity tariff and how this may affect demand for electricity in the longer term, and how this may affect future investment decisions and how long the investment cycle is, where applicable.

² The IEA defines energy security as the uninterrupted availability of energy sources at an affordable price. Energy security has many aspects: long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. On the other hand, short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance.

3. TECHNOLOGY COSTS

B. The IRP proposes that the nuclear power programme must be implemented at an affordable pace and modular scale (as opposed to a fleet approach) and taking into account technological developments in the nuclear space.

Questions

9. Comment on the costs of mature and commercially available nuclear power generation technologies. Provide your comments in line with a mandate to ensure that:

- i. investment in the electricity supply industry is facilitated;
- ii. universal access to electricity is facilitated; and
- iii. competitiveness, customer and end-user choice are promoted.

Comments on costs should incorporate overall cost of the technology and must not be limited to overnight cost.

10. What would constitute modular scale and at what cost would it be affordable for the South African economy?

11. Comment on the cost of other suitable base load technology options the country can consider – whether referenced in the IRP 2019.

12. Comment on the most suitable pace (timing between power units) at which South Africa should implement the nuclear build programme.

13. Comment on the procurement of this capacity now for build beyond 2030

4. THE GENERATOR

C. The generator of this electricity produced will be either Eskom Holdings (SOC) Limited, or any other organ of state, or in partnership with any other juristic person.

Questions

14. Provide your comments on Eskom or any future entity of the unbundled Eskom as the generator of the new generation capacity. Provide your comments under the following three scenarios:
 - a) Status quo remains, that is, Eskom is not unbundled and remains a state-owned vertically integrated utility.
 - b) Eskom being unbundled and Generation, Transmission and Distribution are separate state-owned entities.
 - c) Eskom is not viable and privatised, but as outlined in (a) or (b) above.
15. Comment on the feasibility of a partnership between Eskom and other juristic person in view of Eskom's current balance sheet. What would the risks to electricity customers associated with this arrangement be?
16. Give your comments with regard to the ownership model:
 - a) IPP owned;
 - b) joint venture (RSA & IPP);
 - c) state utility owned; or
 - d) any other applicable model.

5. THE BUYER

D. The buyer of the electricity will be Eskom Holdings (SOC) Limited or any entity determined through the Eskom's unbundling process as the future buyer of electricity.

Questions

17. Provide your comments on the chosen buyer for the capacity. Provide your comments under the following three scenarios:
 - a) Status quo remains, that is, Eskom is not unbundled and remains a vertically integrated utility, with the Single Buyer situated within the System Operator.
 - b) Eskom being unbundled and Generation, Transmission (Wires and System Operator that includes Single Buyer Office) and Distribution are separate entities.
 - c) Eskom being unbundled and Generation, Transmission (Wires) and Distribution are separate entities. A form of ISMO is instituted, with the System Operator also encompassing a Single Buyer Office.
 - d) Eskom is not viable and privatised, but as outlined in (a) to (c) above
18. How should the cost recovery be handled to ensure that the generator earns its revenue. The response should be in terms of the ownership models outlined in question 15 above.
19. Provide what you consider to be the risk associated with the chosen buyer.
20. Must the buyer be paid only for power required by the system, i.e. the generator takes the risk for reduction in demand?
21. In the event that Eskom as an organ of state is designated as generator and buyer, how will this arrangement affect the fairness, transparency, competitiveness and cost effectiveness of nuclear procurement as far as electricity customers are concerned? Should this arrangement be encouraged?

6. PROCUREMENT PROCESS

The procurer is the Department of Mineral Resources and Energy (DMRE), or any other organ of state, or in partnership with any other juristic person. The procurer shall, in the appropriate procurement documentation, specify any qualification and evaluation criteria applicable to this nuclear new build programme.

The role of the procurer will be to conduct the procurement programmes, including preparing any request for information (RFI), request for proposal (RFP), and/or related and associated documentation, negotiating the power purchase agreements, facilitating the conclusion of any other project agreements, and facilitating the satisfaction of any conditions precedent to financial close, which are within its control.

E. The procurer of the nuclear new build programme will be the Department of Mineral Resources and Energy, or any other organ of state, or in partnership with any other juristic person.

Questions

22. Provide your comments on the DMRE as the designated procurer of this capacity.
23. Which other organ of state is best positioned to be the procurer of this capacity and why?
24. Provide your comments in respect of juristic persons that may partner with the state or the nature of the partnership for purposes of this procurement.
25. Which funding model would be suitable for this capacity to ensure a lowest price for the consumer?

F. The procurer designated above will be responsible for determining the procurement process, which will be established through a tendering procedure that is fair, equitable, transparent, competitive and cost effective.

Questions

26. What is the most cost-effective model of plant construction (e.g. turnkey approach, split package approach and multi-contract approach) to avoid excessive cost overruns, noting that the recent Eskom new build was a multiple EPC contract approach, managed by Eskom. To what extent should

Eskom be involved in the actual construction management of the build programme?

27. In the event a non-turnkey solution is preferred, how should the nuclear build work under construction (WUC) be dealt with in the future Multi-Year Price Determinations (MYPDs), given the long lead times of the technology?
28. In the event the generator is in partnership with Eskom and another juristic person, should this jointly operated asset qualify under Eskom RAB when considering the MYPD application?
29. Provide your view on the method chosen for the procurement of the new generation capacity.
30. State how the procurement process proposed can be reconciled with Eskom being the designated generator of this power.
31. Provide what you consider to be the procurement-related risks associated with the capacity in this determination.

G. The IRP 2019 highlights that 'Taking into account the existing human resource capacity, skills, technology and the economic potential that nuclear holds, consideration must be given to preparatory work commencing on the development of a road map for future expansion programme'.

Questions

32. Comment on the socio-economic impact of nuclear new build programme on South Africa (e.g. job opportunities and localisation).
33. Do you agree with the determination as provided by the Minister?

7. CONCURRENCE PROCESS

NERSA has processes and procedures in place to deal with requests for concurrence in terms of section 34 of the Act, which also satisfy the provisions of the National Energy Regulator Act and Promotion of Administrative Justice Act, 2000 (Act No. 1 of 2000).

This consultative process will also include public hearings where stakeholders will be given an opportunity to make oral presentations on the issues raised in this consultation paper.

However, at this stage, stakeholders and members of the public are requested to submit written comments on the issues raised in this consultation paper, as well as any other issues deemed necessary. Written comments can be forwarded to irp-procurement.newcap@nersa.org.za; hand-delivered to Kulawula House, 526 Madiba Street, Arcadia, Pretoria, 0083; or posted to PO Box 40343, Arcadia, 0007, Pretoria.

The closing date for the submission of comments is 5 February 2021.

Comments received after the closing date will not be considered. The date of the public hearing will be announced after the closing date for the submission of comments.

For more information and queries on the above, please contact Mr Dennis Seemela at:

Tel.: 012 401 4600

Fax: 012 401 4700

8. INDICATIVE TIMELINES FOR THE CONCURRENCE PROCESS

The new capacity required is meant to implement the policy position outlined by the IRP 2019. NERSA will follow the concurrence process, which includes public participation as stipulated in **Table 3** below.

Table 2: Indicative timelines of the concurrence process

Activities	Breakdown of Activity	No of days
Receipt of Section 34 Determination		1
Confirmation of receipt	Draft Memo and Confirmation Letter To minister for Chairperson's signature	2
	Letter Approval Processes	7
	Letter sent out	1
Soliciting written comments	Development of consultation and ELS Submission	20
	ELS Submission Approval Processes	10
	ELS / Special ELS Decision	1
	Implementation Approval	4
	Publication Processes	4
	Duration of written comment Consultation	30
	Analysing comments written comments (10 days after closing date)	5
Public Hearings	Notice of public hearing	3
	Consolidate interested Stakeholders	1
	Public hearing Processes	14
	Conducting of Public Hearings	2
ELS Approval	Finalise Documentation	10
	ELS Submission Approval Process	10
	ELS / Special ELS Decision	1
ER Approval	Finalise Documentation	5
	ER Submission Approval Processes	10
	ER Decision	1
Implementation of ER Decision	ER Dcision Implementation approval process	3
	Publication Process	2
	Publishing Decision and RFD	2
Total		149

ELS – Electricity Subcommittee

RFD – Decision and Reasons for Decision

ER – Energy Regulator ('NERSA Board')

Day – Working day

Online public hearings – may be conducted for interested parties to make oral presentations to ELS members

ANNEXURE A: MINISTERIAL DETERMINATION