

ANEXURE A: Responses to CER questions

RESPONSES TO CER QUESTIONS

NERSA's role in concurring to section 34 determinations is not to re-open the development of the IRP and have a parallel plan to compare with DMRE's plan. The role of NERSA is the implementation of national policy. Once gazetted the IRP 2019 becomes a policy document for NERSA to implement by first concurring to section 34 determination and subsequently licence new generator and monitor their compliance to license conditions in order to implement the objects of the Electricity Regulation Act (the Act) as outlined below.

The objectives of the Act are as follows:

- a) the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;
- b) that 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;
- c) that investment in the electricity supply industry is facilitated;
- d) that universal access to electricity is facilitated;
- e) that the use of diverse energy sources and energy efficiency is promoted; and
- f) that competitiveness and customer and end-user choice are promoted.

All the above objectives are pertinent in the concurrence with section 34 determination, the implementation of the IRP talks directly to orderly development of the electricity supply infrastructure as it talks about planning now for future demand, and thereby ensure that the infrastructure meets the needs of current and future customers. The IRP implementation also talks to the use of diverse energy sources as seen by the energy mix.

8.1.1. Did NERSA take any steps to verify the accuracy of these cost estimations?

NERSA did not verify the costs used in the IRP 2019, as the idea for concurrence is not to open up the development of the IRP again. NERSA was (on invitation by the Department) part of the steering committee during the development of the IRP and provided comments on the assumptions used, particularly cost assumptions, for example for Renewable technologies where there is local and real cost data, Bid Window 4 costs were used. Where there was no local and real data, costing reports were then used.

8.1.2. If so, kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions.

NERSA did not consider any additional cost reports to verify the costs obtained from the EPRI report developed for the use in the IRP 2019. It was not for NERSA to reopen the development of the IRP 2019.

8.2.1. Did NERSA consider other options, other than batteries, for flexible generation as alternatives to gas?

NERSA cannot amend the IRP2019 by introducing new technologies since development of the IRP is the mandate of the DMRE. An attempt to consider new technologies can only be guided by the Department as alluded in the earlier paragraphs.

8.2.2. Kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions.

NERSA implements policy, it does not develop it and the IRP is policy. The Act sets out the powers and functions of the Minister of Mineral Resources and Energy ('the Minister').

In accordance with section 34 of the Act, *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 the 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, and*
 - ii. *provide for private sector participation.*

Furthermore, the Section 5 of the New Generation Regulations of 2011 indicates the following;

- 1) *Having regard to the need for new generation capacity as provided for in the integrated resource plan, the Minister may undertake or commission the buyer or another party to undertake feasibility studies in respect of such new generation capacity requirements.*

All the above is mentioned to demonstrate where the role of the DMRE starts and ends and where the role of NERSA starts and ends.

However, what has been observed all over the world is that the development of non-conventional power generation methods i.e. Renewables are usually complemented by gas power generation technology as backup even with battery operated technology. In (International Gas Union, 2020), it is stated the gas development is second to the developments on renewables energy. The report further states that gas is used to complement the renewables energy. With the development of green hydrogen through pyrolysis technology, (International Gas Union, 2020) is of the view that decarbonisation of energy is a real possibility when one considers gas. These are public reports available on the internet.

8.3.1. What documents and evidence did NERSA consider in reaching the conclusion that “gas infrastructure investments will have a multiplier effect to other economic sectors”?

This statement is not based on a particular document but rather knowledge gained by NERSA as it regulates the piped gas industry. The mandate of NERSA in terms of piped gas pricing is to approve maximum prices where there is inadequate competition. Hence NERSA periodically conducts competition assessment¹ of the piped gas industry. One of the main barriers to entry that was identified for the relevant market of trading piped gas to end users is the lack of availability of new gas supplies and the infrastructure required to enable such supplies. During consultations with gas users and stakeholders with the manufacturing sector, the lack of adequate gas supplies has stifled their plans for growth in some instances.

In NERSA’s continuous engagements with industrial users of gas, they indicated that they have modelled their operations such that they only require gas. Given that in 2029, the current gas supply may be depleted and already, the current supplier has indicated that supply will start declining in 2025, this development has left the gas users in a conundrum. The industrial gas users have indicated to NERSA that a looming gas supply crisis is imminent as industry sees a misalignment in time, execution of government policy, development of infrastructure and gas availability. According to these industrial gas users, their members are among the top users of gas in South Africa and they contribute over R150 billion per annum in revenue to the South African economy, employ over 50 000 people and have a combined gas usage of 30 million GJ per year.

¹ http://www.nersa.org.za/Admin/DocumentUpload/UploadFiles/Reason%20for%20decision%20-Determination%20of%20the%20inadequacy%20of%20competition%20in%20the%20piped%20gas%20industry%202018_193840122019114032.pdf (Pg. 52)

In addition, NERSA has undertaken study tours to mature / successful gas markets. For example, Spain has five LNG import terminals and the one in Barcelona is the biggest import terminal in Europe. It is well understood that the development of gas infrastructure investment led to security of gas supply in these countries and they have used such gas energy to power their industries among the varied uses of gas (i.e. thermal use households and industry, chemical feedstock, hydrogen production etc.)

8.3.2. How did NERSA reach the ultimate conclusion to recommend that the PPA should consider the imported gas price to be a pass-through cost to the consumer, particularly in light of paragraph 5.4.2 of the reasons, stating that “The majority of stakeholders raised concerns about the procurement of gas power when there are alternatives in the market, such as battery storage, that can play the same role in the power system without the risk of uncertain imported Liquefied Natural Gas (LNG) prices”?

The majority of stakeholders who responded to the gas section in particular, this equates to approximately 18 out of 44.

- NERSA received a total of 44 stakeholder comments and close to 80% commented on Gas questions posed by NERSA however only 18 stakeholders commented on Gas price risk specifically. The Pass through mechanism relates to pricing it is therefore appropriate to only consider stakeholder comments on gas price.
- All the 18 stakeholders stated that LNG price is subject to commodity prices and exchange rate fluctuations, however only 3 of 18 provided a solution on how to manage this risk i.e by using pass through mechanism. NERSA also supported Pass through mechanism in the PPAs but this proposal is still subject to Piped Gas Regulation framework and NERSA’s process of determining gas prices.
- All the 18 stakeholders stated that LNG price is subject to commodity prices and exchange rate fluctuations, however only 5 of 18 provided a solution on how to manage this risk i.e. by replacing gas generation capacity allocation with battery storage capacity. NERSA did not support this reallocation of capacity because the aim of concurrence is not to re-open the development of the IRP and have a parallel plan to compare with DMRE’s plan.
- The RfD analysed Gas price (section 5.4.11) and reallocation of gas capacity (section 5.4.4) to battery storage and 5 of 5 stakeholders commented on both issues simultaneously thus constituting a majority.
- NERSA reached the conclusion being queried because reallocating gas capacity allocation to storage or any other technology as suggested by stakeholders is not an option hence NERSA only made recommendations on how to manage gas price risk.

Gas is not locally available in South Africa at the moment; it follows that the gas will be imported. There is therefore a certain level of uncertainty around the cost particularly forecasted cost of gas. This is why the permanent gas infrastructure recommendation is made because there is an understanding of the risk associated with importing fuel even if its imported within the continent.

Gas prices are however regulated. NERSA determines a maximum price within the Piped Gas Regulation framework as highlighted in the paragraph above. NERSA therefore will be able to test the efficiency of the costs of fuel brought forward by licensees.

Furthermore, REIPP costs are pass through costs to the consumer even when energy is generated at a time when the system doesn't need it, REIPPs claim deemed energy and these costs are borne by the consumer. The Gas IPPs will follow a similar route, after of cause taking into account efficiency in procurement of fuel as well as all other costs to be borne by the consumer.

Battery storage as contained in the IRP 2019 and forms part of the section 34 determination concurred being deliberated here. Energy storage was allocated 513MW in 2022 and 1575MW in 2029MW, this phasing-in will allow SA to benefit from decline in battery costs as the technology becomes more mature. The inclusion of gas therefore is an outcome of the least cost optimisation similar to every other technology in the plan.

8.3.3. What did NERSA consider in concluding that domestic gas extraction projects would stimulate the growth of gas because the indigenous gas price will not be overly exposed to international market forces? Did NERSA consider other factors in reaching this conclusion?

NERSA used knowledge based on several tours of countries with developed gas industries. Referencing the American shale gas development, where an LNG importing facility was developed with the expectation to ramp up imports, and subsequently discovered shale gas locally, they then converted their importing facility to be an exporting facility and America has thus become a net exporter of gas. This assisted them to cushion the blow of increase in crude oil prices as a result of the 2008 economic meltdown. Furthermore, it would allow South Africa to not have to deal with the risk associated with importing a fuel source as this compromises security of supply if a country depends too wholly on an imported fuel, however the volumes considered here are still low enough to not compromise security of supply. Localising the extraction of gas will bring more benefit to the South African economy beyond the gas-to-power being discussed here.

The section 34 determination has two batches of Gas capacity being deployed, 1 000MW by 2024 and 2 000MW by 2027. The Mozambique shale gas extraction project is under way and is currently at design phases, with a projection of ~5years lead time

to plant completion. It is unlikely that the project will have been completed by 2024 for the first batch of gas generation, a Floating Storage Regasification Unit (FSRU) can be considered. It is however possible that the project would have reached commercial operation by 2027. The volumes of gas utilised as well as future demand for the gas dictates whether continuing to import gas is still effective. The availability of gas in the country gives opportunity to industry and customers to switch from their current source of energy to gas.

8.3.4. Kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions.

The statements were made on the basis of a benchmarking done as a result of several visits to different countries with mature / successful gas industries. The reference is therefore what NERSA staff has seen and not necessary literature. However, reports like IGU, Global Gas Report, BP statistical Review Reports and Shell LNG Outlook talk to the impact of gas in several countries around the world.

8.4.1. How did NERSA reach the conclusion to recommend permanent LNG infrastructure?

The volumes consumed based on the electricity generated from gas-to-power projects as well as any other demand of gas in the country will dictate the need for permanent LNG infrastructure. Given the direction that the energy mix is taking with the move to a system dominated by intermittent renewable technologies, as well as the mandate for the use of diverse energy sources means that all technologies have a role to play in the energy mix. The reports stated in 8.3.4 talk to the rise in the use of gas to support renewable technologies, the drive towards clean technologies is the same one that is driving the increase in the use of gas technologies as it provides the flexibility needed to backup Wind and PV technologies due to their ability to start and stop within minutes as well as ramp up very quickly to respond to the PV that would fall away around the same time in the evening. At the same time gas generation emits approximately 50% less green house gases compared to conventional fossil fuel. With the inevitable growth of the use of these intermittent technologies, there will be a tipping point where the volumes required would dictate and enable the development of permanent gas infrastructure.

It is evident from the time constraints that the required capacity for the first trench of capacity in the IRP 2019, that small scale LNG (ie. FSRU, ISO containers, rail transport etc) will be the suitable method to deliver gas. However, as it is stated above that gas has a multiplier effect, as gas becomes available the gas resource from Mozambique gets depleted, there will be increase of demand of gas and therefore the small scale LNG will not be viable. With increase demand, it will lead to a situation where a fixed terminal will be required and in most cases that how the gas market is developed.

8.4.2. Did NERSA consider the costs, viability and impacts of investing in LNG infrastructure in making this recommendation? If so, what did it consider?

As stipulated above there will be a tipping point where the volumes required would dictate and enable the development of permanent gas infrastructure. This was therefore a suggestion that NERSA felt could be relevant down the line but purely dependent on how the gas development in the country pans out.

8.4.3. Did NERSA consider this in comparison to alternative scenarios that do not include the build-out of permanent LNG infrastructure?

As indicated in question 8.3.3 above depending on when the plant comes online and the volumes of gas to be consumed will dictate the gas supply solution considered. Floating storage units and trucking or railing solution can be considered or FSRU with pipeline can be considered. The competitive bidding process will assist with the ensuring cost efficiency by bidders.

As previously indicated in this paper, the choice of technologies is an outcome of the least cost optimisation and it is not the role of NERSA to propose different technologies. All technology options were included in the model including Battery storage as previously indicated.

8.4.4. Kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions.

As outlined in the answers provided above, NERSA looked at countries whose gas industries are mature and looked at the impact the development of the gas industry has had on those countries to garner some lessons learnt and the possibilities for South Africa. Reports stipulated under 8.3.4 talk to the matters outlined here.

8.5.1 Did NERSA conduct or commission its own independent modelling exercise to verify that the addition of 3000 MW of new gas would be consistent with a Peak-Plateau-Divide trajectory and would not exceed the emissions limit?

It should be emphasised again that the development of IRP is the responsibility of DMRE and not the mandate of the Regulator as previously indicated.

NERSA did not commission its own independent modelling exercise but provided comments to the model developed by DMRE, NERSA was also part of the steering committee developing the IRP and was therefore privy to the details of the modelling as well as assumption used and constraints applied. It is not NERSA's role to develop a parallel IRP model to compare results with the DMRE model, but to assess in

implementing the policy that it is still reasonable and will enable the orderly development of the industry and that the plan responds to the current needs of the electricity system.

8.5.2. If not, on what basis does NERSA believe that the modelling exercise conducted for the purposes of IRP 2019 was accurate?

NERSA is not mandated to determine the accuracy of the modelling exercise post ante. NERSA was part of the steering committee in the development of the IRP 2019, NERSA was therefore privy to the details of the modelling, the assumptions used and the scenarios considered. NERSA provided inputs into the development of the IRP2019. All the inputs from stakeholders were evaluated, including scenarios considered.

8.5.3. On what basis did NERSA decide that the environmental impacts of gas extraction projects should not be considered in its deliberations and should be deferred to the DEA and other relevant bodies?

During licensing of any generation facility, part of the NERSA requirements is that the potential licensee has to meet all environmental regulation applicable to the generation plant they are building, these include an Environmental Impact Assessments specifically for the site where the plant will be built, the potential licensee must further consult the affected community before they can be granted a license to operate the generation facility. It would be difficult to make assertions at this early stage on environmental impact when the location of the site is not yet known in order to ensure that the environmental impact assessment is for the location where the plant will be.

8.5.4. Kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions.

The Energy Regulator cannot venture into forming opinions or conclusions on matter that falls within the legal framework mandated to another sphere of government. The Department of Environmental Affairs regulates all issues relating to the environment as mandated by the National Environmental Management Act (NEMA), and these are not just limited to emissions.

9.1.2. If not, on what basis does NERSA believe that the modelling exercise conducted for the purposes of IRP 2019 was accurate?

NERSA provided comments and inputs to the Model. DMRE engaged an independent consultant to audit the IRP2019 model. NERSA was also part of the steering committee set up for the development of the IRP and therefore was privy to the details of the model.

9.1.3. Did NERSA have sight of the underlying models used in preparing the IRP 2019? If so, kindly supply these models.

NERSA was part of the steering committee set up to develop the IRP, NERSA therefore privy to the details of the model. NERSA cannot share models used as they are owned by DMRE, they can be requested from DMRE.

9.1.4. What is the “the country’s policy” referred to in paragraph 5.5.12?

The Department of Environmental Affairs (DEA) provided scenarios to be used in the IRP 2019 models, these scenarios were based on their country emissions reduction policy which looked at the whole country’s contributions to greenhouse gasses and indicated limits for each industry in order to meet the country goal of greenhouse gas emissions reduction.

9.2.1. Did NERSA conduct its own assessment of the climate change and health impacts of “environmental emissions” from coal-fired power stations? If not, why?

It is not within NERSA’s mandate or expertise to assess climate change and health impacts, the Department of Environmental Affairs (DEA) is entrusted to do such studies. The emission constrain scenarios were received from DEA and were in line with the emissions reduction country mandate.

9.2.2. On what basis does NERSA contend that the IRP 2019 gave proper consideration to the “environmental emissions”? What further documentation and studies, if any, did NERSA consider in making this assessment?

The basis is that the constrain as supplied by the DEA was implemented in the model and as a result reduced the amount of emitting plants built, this is seen by the results of the model and the gazetted energy mix. It is thereby understood that the outcome of the model has taken into account these constrains. It is also important to note that the coal in the IRP 2019 was not forced but came in on its merit with total emissions continuing to stay below the PPD limits.

9.3.1. Did NERSA conduct its own investigation into the need, desirability and local feasibility of each of the HELE coal technologies identified above?

NERSA conclusions were based on the fact that the Eskom coal new builds have made use of these HELE technologies, including the high efficiency boilers and the use of Flue Gas Degasification (FGD) plants, they are therefore feasible and implementable.

9.3.2. On what basis did NERSA conclude that HELE technologies would be feasible?

The HELE technologies are proven, feasible and implemented elsewhere in the world as well as locally as indicated above.

9.3.3. In addition to the above, kindly provide any further evidence and supporting documentation considered by NERSA in reaching these conclusions.

See 9.3.1

EPRI Report 2017²

9.4.1. Kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions

Similar to 9.3.3

Referenced above.

9.5.1. What information did NERSA take into account in determining the alleged benefits of coal?

The information referred to is based on NERSA's knowledge of the sector and observations made. Currently, approximately 75% of the capacity is provided by Coal. South Africa has an abundance of coal supply; it is therefore the source of a lot of job creation as well as export to other economies. The role that coal is currently playing in the economy cannot be undermined. The energy mix is changing, there is no doubt about that, however this transition must be done in a way that does not negatively affect these communities that depend on these coal mines and coal power stations for their livelihoods.

However, the choice of coal and other technologies in the IRP is meant to meet the country's future energy needs within defined constraints and this is the context of the benefit of coal referred to.

9.5.2. What are the socio-economic benefits NERSA refers to?

These mainly include jobs that are created in the mining sector and engineering companies servicing power generation plants, and all the secondary industries that rise to support them. Almost the entire Mpumalanga province's economy is at the backbone of these coal mines and generation power plants connected to them. This sector creates permanent jobs that last the life of the plant of 50 years or more. There is no denying that the coal sector has been the mainstay of job creation in South Africa and is continuing to do so. This is expected to change over the next few years as the

² <http://www.energy.gov.za/IRP/irp-update-draft-report2018/EPRI-Report-2017.pdf>

country is moving towards cleaner resources. There are many communities that have been built around these mines and power stations, failure to ensure a just transition will have a negative impact on these communities.

Public information is also available (e.g. Facts and figures 2018, Minerals Council of South Africa) on the contribution of the coal mining to South African economy.

9.5.3. What negative impacts of coal did NERSA consider in conducting this assessment?

The health impacts of communities living close to coal generation plants is understood, new coal is significantly lower than the existing coal as well as coal due to be decommissioned by 2030, this combined with the obligation to ensure that any new coal is cleaner will result in a net reduction in greenhouse gas emissions. It is therefore understood that the greenhouse gases emitted will be significantly reduced.

Furthermore, during licensing the generator needs to provide an Environmental Impact Assessment (EIA) that must ensure compliance with all environmental obligations. The license applicant must take their project through a public participation processes to ensure that stakeholders from local communities who will be directly affected by the plant are consulted and get an opportunity to have their views taken into account before the license is granted by NERSA. Again to emphasise that NERSA is not an environmental impact regulator and that there are bodies responsible for this and NERSA is satisfied that these bodies have and will continue to execute their roles as far as this matter is concerned.

9.5.4. Kindly provide the further evidence and supporting documentation considered by NERSA in reaching these conclusions.

Consideration taken is processes that NERSA conducts in issuing licenses as well as knowledge at NERSA disposal as a result of being the economic regulator to Eskom.

9.6.1. On what basis did NERSA come to the conclusion that HELE technologies “seem to be a reasonable compromise”? Are these the same HELE technologies identified above in paragraphs 5.5.13 and 5.5.14?

Yes, HELE technologies referred to in the whole document are one in the same. The assumptions made in the developing of the IRP 2019 were that new coal will be cleaner coal, adding this cleaner coal into the energy mix does not violate the emissions limit applied and are therefore supportive of the country environmental policy position. Furthermore, as stated above a number of coal units are due for decommissioning by 2030, the combination of the coal being commissioned and a fraction of that being added as new coal but a less emitting version results in a net decrease in greenhouse emissions in the medium to long term. It is therefore a fair compromise as it assists in keeping some of the jobs that would have been lost due to decommissioning of the coal units and still ensures a reduction in emissions. All this

combined with the mandate to ensure a diverse energy mix as well as the system need for dispatchability and the provision of ancillary services means that there is room for this technology in the energy mix.

9.6.2. What information did NERSA take into account in assessing South Africa's coal export market?

Data on coal exports is available from public sources (e.g. South African Coal Exports Outlook, Energy Price Report, etc.).

9.6.3. Kindly provide the evidence and supporting documentation considered by NERSA in reaching these conclusions.

The above are public sources.

10.1 Kindly provide NERSA's reasons for declining to hold a public inquiry, in terms of section 4(4) of PAJA.

Covid -19 made it difficult to hold public hearings. At the time the Energy Regulator took a decision to suspend all public hearings. The consultation paper was comprehensive enough that it allowed stakeholders to provide sufficient details in their comments resulting in the Regulator being satisfied that there is a sufficient information submitted for it to make a well-considered decision.

10.2 What steps, if any, did NERSA take to consider the views of affected communities that were unable to submit written comments?

Since it is only the concurrence stage and no information is yet available on where the plants will be located, it was difficult to bring the consultation process to the affected communities. During licensing, the location of the plant will be known, the potential licensee is obligated to consult with the community that will be directly impacted by the generation plant.