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Our Ref: J27035

10 February 2011

Attention: Mr. Muna Lakhani

Dear Sir

ESKOM ENVIRONMENTAL IMPACT ASSESSMENT (EIA:12/12/20/944) FOR A PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE: COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Your correspondence to Ms. Bongi Shinga of Acer (Africa) refers.

Arcus GIBB acknowledges receipt of the above-mentioned letter. We thank you for your valuable comments and your participation in the Eskom Nuclear Power Station (NPS) Environmental Impact Assessment (EIA) process to date. Your questions and comments concerning the Nuclear-1 have been noted.

Responses to your comments / questions are as follows:

Your comment (1)

Please receive this and attached documents, and confirm receipt in writing.

Response (1)

We confirm receipt of the document.

Your comment (2)

We confirm that every point made, is to be taken as a critical omission, and is required to be addressed in full in the final EIA. Every question, statement and query must be addressed in full in the final EIA. We request full analyses of each point made, with regard to Life Cycle environmental, economic and social impacts, life cycle costs and an unbiased report, that is wholly supported by fact, and not based on the opinions of a few, or of the relevant vested interests.

We shall assume that any of these issues being omitted in the final EIA will be seen as a limitation of our constitutional and common law rights, and shall consider that such omissions or incomplete information supplied are an automatic case of a fatal flaw in the EIA.

We require that our submission is contained in full in the final report, including this document, and the documents sent separately which are listed in the Appendix. Any attempts to limit, omit or edit our submission shall be considered an attack on our rights, and we reserve our options to defend our rights, and to respond in any way we see fit, up to and including the Constitutional Court.

We reserve all our rights in all regards.

Comment on the draft EIR shall not be misconstrued as support of any kind for nuclear power anywhere. The order of our comments are not to be construed to be a hierarchy; rather they are all of equal importance, and are required to be addressed in full.

Response (2)
Your comments are noted.

Your comment (3)

Contents

Response (3)

Noted.

Your comment (4)

Submission to Draft EIR on Nuclear 1

No where in the world does a "Generation III up to 4000MW PWR" exist; therefore, we contend that it is impossible to assess any impacts. As such we consider that this EIR is legally incompetent, illegal, and based on opinion. Opinion is no basis for what is purportedly a rigorous scientific study. We seek a legal ruling from government, via yourselves, in this regard.

Response (4)

Your comment is noted. Technology that is involved in the construction and operation of a nuclear power station of this nature has been developed over last decade and is well known, as it is based on the Pressurized Water Reactor (PWR), of which the Koeberg Nuclear Power Station is an example. It is recognised that no Generation III PWR reactor of up to 4000 MW is currently operational. Known PWR designs in the market have a maximum output of 1650 MW, and this implies that several such units would be purchased with a total of less than 4000 MW. This technology has evolved over decades from the Generation II plants, which have also improved their safety systems over the years. Generation II reactors were phased out at the end of the 1990s and since then, several commercially available Generation III reactors have become available from different vendors. These plants are all evolutions of the well-known and understood PWR technology, which has been operational since the 1970s. Moreover, the application for environmental authorisation does not only relate to construction and operation of the reactor type specifically but also to associated infrastructure and how this may trigger listed activities in terms of the National Environmental Management Act and as a result have an impact on the environment. The Environmental Impact Assessment Practitioner as well as the independent specialists appointed to conduct specialist investigations at the alternative sites are well acquainted with the environmental impacts that may be associated with a development of this nature in terms of supporting infrastructure provision.

From your comment, it would appear that you do not regard **any** new technology to be suitable for implementation, as the impact of that new technology would, by definition, be untested in practice. If this principle is applied consistently, no technological advances would ever be made.

Your comment (5)

It is stated in the documents that the "objective to analyse cost effectiveness from a "*broader community perspective".* It is clear that no information is supplied as to what is meant by such vague statements, and no proof is provided for assessing accordingly. Without such clarity, the process is meaningless – if clarity exists, then this must be made available, and due process for comment allowed.

Response (5)

The cost effectiveness of the proposed power station is assessed from the perspectives of the national and provincial economies (i.e. in terms of GDP and Gross Geographic Product). The assessments are adequately documented in the Draft Environmental Impact Report and in the Economic Impact Assessment (Appendix E 17 of the Draft EIR).

Your comment (6)

It is also clear that this process is not looking at full costs, or life cycle costs, a fatal flaw. We request that each energy/ electricity option be studied with a full life cycle analysis in mind, from extraction to final decommissioning and waste handling for all options. This is a specific requirement from the DEA documentation in our hands.

Response (6)

Your comments are noted. This application for environmental authorisation relates specifically to the impacts of a Nuclear Power Station on three specific sites: Duynefontein, Bantamsklip and Thyspunt. It is not the intention of this EIA, neither was it required by the DEA approval of the Plan of Study for EIA, to perform a full life cycle analysis. Reference is made to life cycle impacts of different generation options in Section 4.2.2 of the Draft EIR and revised Draft EIR. An analysis of the life cycle impacts of nuclear power generation vs. other generation technologies indicates that nuclear power emits less than 11 grams of carbon equivalent per kilowatt-hour (g_{Ceq}/kWh) (Dones et al. 2003[1]). This is the same order of magnitude as wind and solar power. This is also two orders of magnitude below (i.e. one hundredth of) the average for coal, oil, and natural gas (Figure 1). Apart from these benefits, nuclear power generation does not emit sulfur dioxides (SOx), nitrous oxides (NOx) and requires much less water than coal-fired power stations, as the proposal for Nuclear-1 is to make use of sea water for cooling. This is a particularly important factor in a water-stressed country like South Africa.

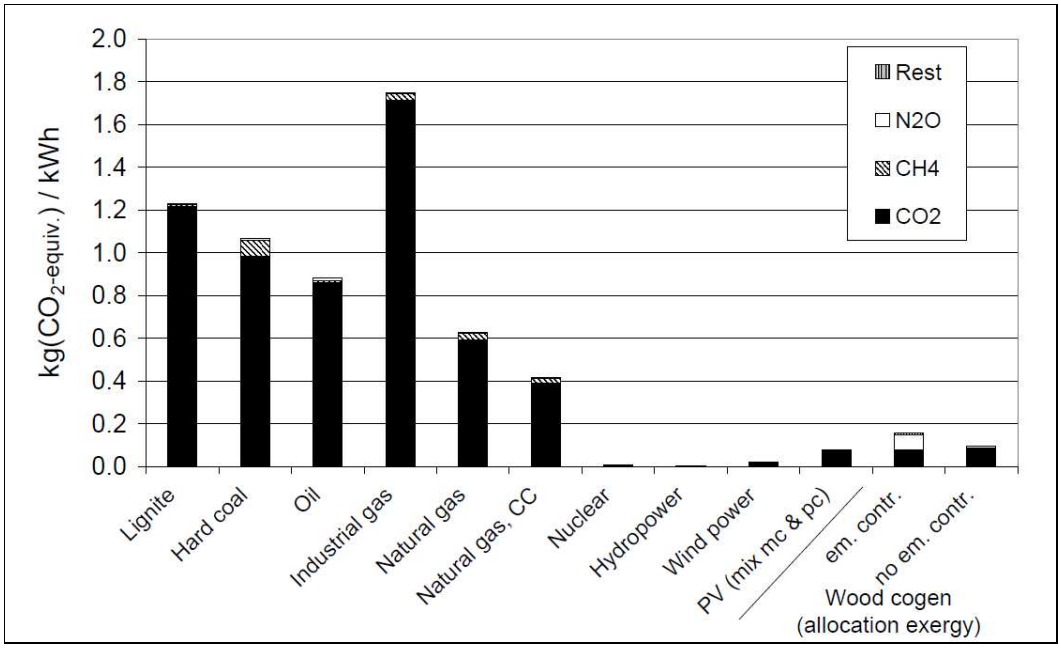

Figure 1: Comparison of life-cycle greenhouse gas emissions of different electricity generation systems (from Dones *et al.* 2003)

Your comment (7)

[1] Dones, R, Heck, T & Hirschberg, S. *Greenhouse Gas Emissions from Energy Systems: Comparison and Review*. In Paul Scherrer Institut 2003 Annual Report. Paul Scherrer Institut: Villigen, Switzerland.

"Perceptions regarding a NPS are frequently based on a lack of scientific information about perceived impacts." This is a problematic statement, as abundant research exists that supports Earthlife Africa's anti-nuclear position. Some examples are attached. We request that the scientific basis for objecting to nuclear power is shared with all stakeholders in full.

Response (7)

Your comment is noted and all your examples will be included as Appendices in the Issues and Response documents. Arcus GIBB stands by the statement. The safe operation of 439 reactors currently in operation around the world, 266 which are PWR technology clearly demonstrates that Nuclear technology is one of several appropriate technology options. It is also requested of Earthlife Africa that the arguments put forward are based on fact and that the public are not misled. There is, for example, a widely held misconception, exhibited during the last round of public meetings for Nuclear-1, that human-made radioactivity is the only source of radioactivity in the environment, and that there are no natural sources of radioactivity. Resultantly, there is an erroneous belief that, without human-induced radioactivity, there would be no radioactivity in the environment. It is also a common fallacy that a nuclear power station can "explode" like a nuclear bomb.

Your comment (8)

The economic study is limited to impacts on "*tourism and fishing*". No analysis is made of the macro-economic environment – we request that a full economic analysis is included and time and space made available for adequate comment; the capital cost is not substantiated in any way – evidence of how this figure was arrived at, whether it is an "overnight" cost or not, and the full referenced sources of the information must be made available; nor is any analysis made of the full life cycle costs (social, economic and environmental, as required by NEMA) of the proposed plant to the people and the SA economy – we specifically request this; no sources of funding are identified – all possible sources of funding, and their willingness to fund Nuclear programmes must be provided in full; the knock on impacts of increased electricity prices are not mentioned – any and all impacts on future prices for the life cycle of the proposed plant and its alternatives must be made available in full; life cycle costs of fuel, total emissions and waste disposal are not calculated – these must be made available in full and fully referenced; decommissioning is not even estimated as a total – all such costs must be referenced and provided. The upstream costs, likewise, are not even mentioned – all such costs must be included from a life cycle perspective. All costs attached to the full life cycle must be included, for all options that generate electricity, as requested by the Department.

Response (8)

Chapter 3 of the Economic Assessment (Appendix E17 of the Draft EIR) specifically assessed the macro-economic impacts of the three sites based on their relevant economic support bases (i.e. the Eastern and Western Cape), with the objective of estimating contributions to economic growth and the distribution of income through the ability to create jobs. Sources of funding cannot be addressed, as Eskom has not yet applied for funding for the proposed nuclear power station until certainty is obtained, through the environmental and other relevant authorisations, whether the nuclear power station is likely to be constructed at all.

The impact on prices of electricity is not assessed in this EIA process. The future energy mix, associated costs and future pricing impacts are presented and discussed in detail in the Draft Integrated Resource Plan recently released by the Department of Energy.

Your comment (9)

The statement by the consultants that "*in their opinion, Renewable Energy cannot supply baseload*" is rejected in its entirety and represents another fatal flaw in the draft EIR – we would like to see, in writing, the acceptance of government of this statement. The opinions of the few elite cannot be allowed to hold South Africa hostage to either nuclear harm nor to multi-generational impacts and costs. We specifically request full economic, social and environmental costs for the full value chain of all possible electricity generators upon which rational decisions can be made.

Response (9

Your comments are noted. As stated in response 6 this application for environmental authorisation relates specifically to the impacts of a Nuclear Power Station at one of three specific sites: Duynefontein, Bantamsklip and Thyspunt. It does not aim to establish the energy mix to be implemented in South Africa in terms of energy provision as this falls within the ambit of the IRP and IRP 2010 processes. The purpose of this EIA process is not to holistically consider the full life cycle impacts of all possible generation options. The appropriate mix of generation options is a function of the IRP 2010 process. In this regard, please refer to the IRP 2010 documentation available at: http://www.doe-irp.co.za/

In terms of alternatives to meeting the present energy demand, given the state of present technology, renewable energy sources are not yet in a position to replace base-load power stations at the capacities being considered for Nuclear-1. Please refer to section 5.3.2 of the Revised Draft EIR for an analysis of the equivalent area that would be required for wind power generation to produce at the same output as a base load power station. The capacity factor of wind generated electricity at coastal sites (i.e. the percentage of time that it is capable of producing maximum output) is 30%. A base load power station is regarded to be one that can produce maximum output at least 75% of the time. Thus, in order to ensure that wind power can produce consistently at its installed capacity, three times as many wind turbines needs to be installed (i.e. at least 12 000 MW). To produce at the same capacity as 4 000 MW of base load power, depending on the diameter of the wind turbines (80 to 90 m), an area between 273 000 and 345 000 ha would be required. Although solar power with storage may become an option in future, it as not yet reached a point where it is proven as a base load option and as an economically viable alternative for coal or nuclear-generation.

Your comment (10)

From the draft report: "*In many countries, including South Africa, economic growth and social needs are resulting in substantially greater energy demands, in spite of continued and accelerated energy efficiency advancements. As a result, electricity demand is growing faster than overall energy supply."* Again, no evidence is presented for either part of this statement – there is no substantial energy efficiency programme in SA, nor are any such results shown. We request full and referenced details of all such programmes and their impacts. No potential impacts of such a programme are demonstrated, nor are any benefits presented – we requested full and referenced information in this regard. Given that social needs are limited to under 20% of total demand, it becomes clear that it is in the terrain of industrial use that is responsible for unsustainable energy consumption – no analysis is presented regarding how the South African economy and citizenry benefit from electricity – such a report, fully referenced, is a bare minimum request (Refer to Eskom website http://www.eskomdsm.co.za/library#Reportsdocs). There also appears to be no assessment done of, for example, the impacts (direct and indirect) of energy intensive users, nor evidence of insistence on

proper DSM programmes. Not a single DSM programme is mentioned in the EIR, nor any economic analyses of such programmes – we specifically request this information and in a fully referenced form. There appears no motivation for the proposed energy path of the country – we request full access, and adequate time to assess all documents used in arriving at this conclusion (Refer to www.eskom.co.za/annreport09/ for more details on DSM programme).

Response (10)

The Eskom demand Side Management (DSM) programme has been in place for some time and is considered in the Integrated Resource Plan as one of a suite of alternatives to be implemented in order to reach the goal of 40 000 MW of capacity expansion by 2025. The IRP, in its recommended "Balanced Scenario", indicates a maximum possible saving of 3 420 MW by 2017 (steadily increasing from current low levels but reaching a plateau by 2017). Under a scenario of "Enhanced Demand Side Management", the IRP predicts a maximum saving of 4 954 MW by 2017, again reaching a plateau by that year. Thus, whilst DSM must remain a cornerstone of the capacity expansion programme, it cannot substitute an increase in capacity and needs to be pursued in parallel to the expansion of capacity - in terms of both base load and renewable technologies.

Your comment (11)

"At present, only a few energy sources capable of providing a sustained power supply are available in sufficient quantities suitable for base-load power stations. Identified renewable forms of energy, for example, solar, cannot supply base-load power stations. . In this context, nuclear power generation is likely to be able to provide an alternative mitigation strategy for greenhouse gas reductions, while providing the energy required."

We are of the opinion that the second statement is an outright lie - wind and solar do indeed provide base load, as do tidal race, solar chimneys, wave and other forms. We request fully referenced studies that confirm the position adopted, and assume that your position is based on the majority of findings internationally in this regard. Additionally, all energy generation and demand issues must be presented with their GHG impacts for the life cycle – since this information is not provided, the last statement is simply an opinion, and as such, unscientific – we specifically request that demand side management, alternative economic development paths, and all forms of energy are assessed for GHG impacts before any such statement is made.

Response (11)

We stand by our statement and have referenced relevant documents in this regard in the Revised Draft EIR.

Your comment (12)

9) We specifically bring to your attention the unilateral rejection by the consultants of all and any Renewable Energy options in the Draft EIR. We further bring to your attention the following:

"The NEMA EIA Regulations of 2006 define alternatives in relation to a proposed activity as

"different means of meeting the general purpose and requirements of the activity, which may include alternatives to the –

- property on which or location where it is proposed to undertake the activity;

- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity; and
- operational aspects of the activity;"

Alternatives are considered as a means of reaching the same need and purpose as the originally proposed project in a way that minimises its negative and maximises its positive impacts. Alternatives that are considered must be reasonable and feasible."

We confirm that we insist that all Renewable Technologies and Demand Side Management issues be placed squarely back within the EIA process for Nuclear 1, both the various technologies, and their operational aspects, including upstream and downstream impacts. Failure to do so shall constitute a further fatal flaw, and we reserve all our rights in this regard.

This includes lack of consideration of uncertainty and potential cumulative impacts.

Response (12)

The energy mix for South Africa are evaluated in the Integrated Resource Plan. EIA's are carried out for specific technologies. Eskom has a varied portfolio of renewable projects (Wind, Concentrating Solar power, Concentrated Photovoltaic, Underground Coal Gasification, biomass etc) under various stages of development in addition to Nuclear and other technologies. Key impediment to accelerated development of renewables in the country has been policy and regulatory vacuum of which DoE has been working tirelessly to clear. Eskom Demand Side Management project is very advanced and has produced considerable savings in wasteful energy use.

Your comment (13)

Another limitation is that no information is yet available on the capacity of the roads and bridges to carry the abnormal loads which will be involved in the transportation of imported equipment for the NPS. Some of these loads might weigh up to 750 tons. Although Eskom has given the assurance that road infrastructure will be upgraded wherever required, the costs could be very high and are not considered in this analysis.

Without this, it is fatally flawed, as it cannot be confirmed if the plant can indeed be built, and what the final cost will be.

Response (13)

An initial assessment of the roads and bridges has been undertaken and found that, in the case of Bantamsklip, significant upgrading of roads and bridges would need to be undertaken. It also found that minor upgrading would need to be undertaken for the Thyspunt and Duynefontein sites. The Transport study has been revised and will be published with the revised Draft Environmental Impact Report

Your comment (14)

Where is the impact of radiation on farming? It is clear that the daily emissions of Caesium and Strontium, for example, accumulate in plants – this is a critical omission.

Response (14)

The effect of radionuclides on the rearing of livestock and crop production is described in section 3.3.1 and 3.4.1 of the Agricultural Assessment (Appendix E21 of the Draft EIR). However, the Agricultural Assessment only identifies the generation of dust during the construction phase, labour shortages and wage increases, and market effects as potentially significant impacts on agricultural practises. The Agricultural Assessment also includes a review of the potential effect of the proximity to a nuclear power station on certification of organic produce. None of the organic certification schemes include any criteria with regards to proximity to a nuclear power station. The Koeberg Nuclear Power Station is a good example in practice – organically certified wines are produced within sight of the power station. Extensive and long-lasting monitoring of radionuclide levels since before the start of Koeberg's construction has never found any radioactive contamination exceeding legal limits. The results of this monitoring has been made publicly available.

Your comment (15)

The law and the Department have insisted on waste management being included – we do not see any solution proposed, far less the attendant costs. This gap must be rectified.

Response (15)

Please refer to the Radioactive Waste Management report included as an Appendix E 29 in the Revised Draft EIR.

Your comment (16)

According to the document:
Table 3.3: Reactor Standard Cost (R million) Reactor Construction Cost 170,000 Correction Value 19,725
Reactor Standard Cost 150,275
Source: Mr J Breytenbach, Project Manager Nuclear-

We note that international reactor construction companies are not quoting for a completed reactor – this implies that the figure given is an opinion, rather than being based on a firm quote. We request that the cost structure be further interrogated, and be based on actual quotations received – failing which, the economic basis for a reactor must fall away, and the figure removed from the final EIR.

Response (16)

As indicated in the Draft EIR and the public participation process, the appointment of vendors for Nuclear-1 has not yet taken place and is the subject of government negotiations with potential suppliers.

Your comment (17)

According to Nuclear-1 staff, a total mass of 32 tons of Grade 2 and Grade 3 radioactive waste will be transported annually from Koeberg to the Vaalputs Nuclear Waste Site, at an average of two loads per month. A similar volume of waste was assumed for a Nuclear-1 plant. Given that the plant proposed has not been built, or run anywhere in the world, surely any figure given is an estimate, and is not based on factual data? This constitutes a further fatal flaw.

Response (17)

The rates of conversion of nuclear fuel to high level nuclear waste are well known, based on the operation of nuclear power stations based on similar technology over several decades. The physics nuclear fuel are also well understood.

Your comment (18)

Some further key gaps exist in the draft EIR, which includes the macroeconomic component. The current draft ignores issues concerning balance of payments; interest on capital; potential sources of funding; and future costs, which should include full life cycle costs, as well as realistic decommissioning costs – we refer you to the current costs being used in the UK with regard to decommissioning.

The document states: *"Decommissioning*
The issue around decommissioning and economic impact of the action will be driven and influenced by a number of factors including the following:

If the NPS operates for its full anticipated lifetime of 60 years, it will be a closing down exercise with very little difference between the sites except for the cost of removing the nuclear waste where the actual disposal site is located further from the one proposed site than the other.

Further scientific development over the lifetime of the plant can also mean that the plant can be revitalised and the lifetime extended. The present mothballed coal-fired power stations of Eskom are an example, where updating them has added fifteen plus years to their productive lives. Again, very little difference between the three sites will exist.

The third issue to be considered is that if the envisaged Eskom nuclear programme materialises, more than one unit will by then be constructed at each site, with the expertise and know-how available to proceed with the decommissioning if still necessary."

However, it does not say what it is likely to cost.

Further, it states:

"Without commenting on the validity of the applicable scientific methodologies and the accompanying risk assessment, we would for the rest of the report accepts that the most conservative scenario, namely, a 2.5 m sea-level rise, is the one that could materialise. This will be used as a benchmark for the comparison of the three different sites and the possible economic and financial impacts."

The Precautionary Principle, amongst others, insists that the worst case scenarios be considered, not the most conservative. This must be corrected.

Response (18)

Your comments are noted. The terms of reference of the Economic Assessment required a comparison between the three alternative sites. To accomplish this a detailed Macro Economic Analysis (MEA) of the construction phase and a Cost Effectiveness Analysis (CEA) was conducted.

The construction cost of a nuclear power station was needed to do the MEA, as the core costs of a power station would not differ from site to site. However, the impacts on the economy would differ from site, depending on a number of factors. The Western Cape economy is much bigger than the economy of the Eastern Cape, so the linkages differ. Thyspunt is, for instance closer, to the steel factories in Gauteng than the sites in the Western Cape.

Therefore decommissioning, in the first instance, is not going to influence the process except in the transport of the nuclear waste. Secondly, to the Economic Assessment did not aim to compare nuclear power to coal or any other, where the actual decommissioning cost becomes a very important factor.

Eskom furthermore has a comprehensive decommissioning plan for the Koeberg Nuclear Power Station and the information provided in Chapter 3 in this respect is a summary of what is contained in this plan. The information in this plan is relevant to Nuclear-1 as both the existing Koeberg and the proposed Nuclear-1 are Pressurized Water Reactors (PWRs), with generically similar decommissioning strategies. Guidelines on the decommissioning process were used to assess the impacts of decommissioning. The radiological aspects of decommissioning will be covered in a detailed decommissioning plan in terms of the National Nuclear Regulator (NNRA) Act and will be reviewed by the National Nuclear Regulator (NNR), as part of its licensing process.

Your comment (19)

"Of 1,400 permanent staff at a NPS, 1,000 will be professional and technical personnel, i.e. they will have some tertiary qualification. The balance will consist of secretarial and support staff. At Duynefontein staff could be reduced to 1,200 as there are expected to be some economies of scale with the adjoining Koeberg NPS regarding support staff."

Where will they come from? The fact is that South Africa and the world are short of such qualified people, and it is suspected that they will have to be sourced from outside South Africa – this must be clarified.

Response (19)

Your comment is noted. Professional people cover all disciplines necessary at a power station viz physicists, chemists, accountants, engineers, HR practitioners, environmentalists, many at university and technikon graduate level. Previous recruitment experience shows that these people are available in South Africa. . Eskom has in-house programmes which are continuously reviewed based on skills requirements, employees. Koeberg also serves as a suitable training facility which was not available when Koeberg was commissioned many years ago.

In addition to graduates a large percentage of staff are artisans at various trade levels viz fitters, electricians, mechanics, welders etc as well as semi-skilled trades like scaffolders, laggers, riggers and others. Training at this level to trade test level has always been a priority for Eskom and is continuing. Once the decision to proceed with Nuclear 1 is made there will be sufficient time to develop the skills for the operation of the plant. It is Eskom's intention is to source in RSA and train in-house however, some specialist would be sort form outside RSA.

Your comment (20)

The document speaks to waste management, but does not attach a cost to it. This is a fatal flaw, and requires correction and addition.

Response (20)

Your comment is noted. As indicated above, the economic assessment was required to compare the costs and benefits of the sites. The amount of waste that would be generated at each site is the same, and therefore the only difference in cost with respect to waste management is the transport distance. Transport distances were considered in Section 3.2.1.3.5 of the Economic Assessment (Appendix E17 of the Draft EIR) and the differences in costs are reflected in Table 3.18 of that report. The costs of

low, medium and high level waste disposal (apart from transport costs) would be the same at each site and were therefore not considered, as the intention was to compare the sites.

Your comment (21)

The document states: "4.5.1 No-Go Alternative

If no Nuclear-1 is built, the differential effects on the three sites would be zero. However, based on the increasing electricity demands associated with increased economic growth in South Africa, the No-Go (no development) alternative is not considered to be a feasible alternative to the development of a NPS or, for that matter, any other type of energy-generating facility. The power outages experienced in 2008 affected all sectors of the economy, and illustrated that the provision of additional power is imperative if new large development projects (especially those that are energy-intensive, e.g., the proposed aluminium smelter at Coega) are to go ahead. Indeed, Eskom has a considerable programme for producing additional power: it has to provide additional large-scale, base-load power stations, either through nuclear power or through the development of additional coal-fired power stations. If it does not, the economic growth of the country will grind to a halt since a modern economy requires constant additions to its power supplies if it is to grow. The current Eskom programme includes both nuclear and coal-fired power stations, while the Department of Minerals and Energy is assessing private-sector interest in renewable energy projects. Expressions of interest by companies interested in such projects were submitted in October 2008. In addition, Eskom is to import power from a coal-fired power station to be constructed in Botswana.

It is clear, therefore, that the No-Go alternative is not a practical proposition for the South African economy."

This information is not substantiated by any facts – assumptions of already cancelled projects, such as the aluminium smelter at Coega, or that high volume users will continue to be the economic development path of the country. This statement is also made in advance of the upcoming Integrated Energy Policy, as well as the currently in draft National Strategy for Sustainable Development, and as such, simply represents opinions rather than facts. Further, any Renewable Energy potential is also not adequately assessed, both with general potential, nor as individual technologies. We specifically request that a genuine, Life Cycle Analysis of each and every Renewable Energy technology and energy efficiency, be carried out to enable meaningful comparisons – this is a legal requirement of the law.

Another extract"

"The other alternative technology would be that of renewable energy. Identified renewable forms of energy, for example, wind and solar, have inadequately developed technology to provide large-scale power generation facilities that can supply a reliable base load and easily integrate into the existing power network in South Africa. It has been pointed out that the only parts of the country that are practical for wind power are the south and west coasts, but that output will oscillate widely because more wind energy is produced in summer than in winter. The cost of electricity generated by wind power will be almost three times that of Eskom's current installed capacity (Engineering News, February 2008). This is not to say, though, that wind, solar and even wave energy cannot be developed cost-effectively in due course, but at present they are not economic alternatives. None of these alternative sources are able to provide the volume and regularity of power supplies needed for base stations."

This paragraph is filled with myths and unsubstantiated information. Even the then Acting CEO of Eskom confirmed, under oath in January 2010, that (for example) the costs of generating baseload for the Western Cape, some 5000 MW, can be done either with wind OR with concentrated solar power, at about the same cost as a nuclear plant. One can glean from this statement that the rigour in the current study is missing, and the rejection of Renewable Energy as both baseload or otherwise, is simply the opinion of a few, and unsupported by any facts – certainly, none are presented – as such, untested opinion has no place in a study of this nature, and requires correction. Further, you quote information that is at least 2 years out of date, and much has happened to date, particularly with regard to costs of generation.

Another extract:

"The question, nevertheless, is sometimes asked as to what the cost implication of Nuclear-1 would be in relation to other electricity-generating activities. In South Africa comparative costs are sketchy, but when all social costs (including the environmental impacts of carbon emissions) are taken into account, coal-fired power stations are more costly than nuclear. The technologies for renewable energy alternatives such as wind, solar and wave, have not yet been developed to beyond the level of small scale plants. It is pertinent to refer to the findings of a government White Paper in the UK (2008) which stated that all evidence pointed to the costs of nuclear power being lower than that of coal and gas."

Again, this is an individual opinion, and not borne out by facts; it is also misleading and untruthful, as wind and solar (both PV and CHP) have already been applied in bulk generation applications; given that China, for example, has some 27000MW of wind power to date, confirms our position. The opinions stated must either be supported by genuine science, analysis and research, or removed from the next such document. Again, quoting one source is hardly adequate evidence, both because of its bias, and as to its lack of clarity of whether full life cycle costs are included or not – you would be prudent to include, for example, the current multi-billion Pound Sterling bill facing the nuclear industry in the UK; such costs are obviously not counted in your example, and probably other omissions exist.

The selective comparing "bad" with "worse" is disingenous, as there are hardly any comparative negative social costs attached to Renewable Energy, and together with Energy Efficiency, actually represent a social benefit, including but not limited to, more decent jobs and lower negative health and environmental impacts. This must be corrected.

Response (21)

Your comment is noted. However, with respect to the no-go alternative, from an economic point of view (since your quotes are from the economic assessment), it can certainly be argued that the alternative of doing nothing to improve South Africa's electricity supply (the no-go alternative) would be more damaging to South Africa's economy than the alternative of building more power generation capacity. As indicated in the EIR, South Africa has a projected need for 40 000 MW of additional electricity generation capacity by 2025. Even given the current situation, as indicated in Chapter 4 of the Draft EIR, the net reserve margin is far below what it should be to provide security of power supply. Although it is argued by some I&APs that renewable technologies may provide an alternative to nuclear power generation, they cannot supply the entire 40 000 MW required by 2025, which means that substantial base load generation will continue to be required.The Draft Integrated Resource Plan

further recommends that a "Balanced Scenario" represents a fair and acceptable approach considering the divergence in stakeholder expectations and key constraints and risks, including:

- Affordability/Funding availability
- Reducing carbon emissions
- New technology uncertainties such costs, operability, lead time to build etc
- Water usage
- Job creation
- Security of supply

The Balanced Scenario was developed based on the most probable scenario inputs or outputs: Government policy objectives for a diverse generation mix, including renewable and alternative energies; demand side management; and energy efficiency forecasts.

Your comment (20)

Another key gap in the Draft is the timing of potential generation capacity – even the consultants stated at Public meetings (minutes of which are still outstanding, and reflect a less than worthwhile process and lack of feedback and information to civil society, another fatal flaw) that it is highly optimistic to assume that Nuclear 1 will be up and running by 2018 – and in the same statement made by the then Acting CEO of Eskom, he confirmed that 5000MW of wind or solar could be installed in as little as 4 years. These issues must be taken on board for this EIR to be considered rigorous.

Response (20)

It is acknowledged that Eskom's anticipated starting date for operation of Nuclear-1 is very optimistic. GIBB has indicated as such during the public meetings in the EIA phase. However, as much as this may be true, it does not reduce the need for additional non-coal based base load generating capacity in parallel to renewable generating capacity. Eskom will align the timelines with the Draft Integrated Resource Plan which states that the first unit would be required in 2023.

Your comment (21)

It would be laughable if it were not true, that some of the most significant environmental and social impacts, viz. radiation, and daily emissions, are not included in the draft. This is a further fatal flaw, and must be corrected.

Response (21)

Radiation emissions have been addressed in several of the specialist reports, including Air Quality (Appendix E10), Human Health Risk Assessment (Appendix E24) and the Agricultural Assessment (Appendix E 21).

Your comment (22)

Financial data is both weak and in most cases, non-existent – the full comparison of each and every generation technology, required by law, should also have added to same, the work /jobs potential for South Africans, and the impact on future generations, in all ways, not only limited to the currently missing financial information. Further, no where is it explained as to how South Africa will be able to afford these open-ended cost structures, currently applicable to nuclear power world wide. A further fatal flaw.

Response (22)

As indicated above, the EIA for this project is project-specific and related to three specific alternative sites. The analysis of alternative generation options cannot be undertaken in this EIA, as the mix of generation alternatives is dealt with in the IRP process.

Your comment (23)

The attempt to interrogate Climate Change and Greenhouse Gases (GHG) is also problematic, as the comparisons are between coal and nuclear, with no attempt being made to assess that of efficiency, and each and every other potential generation technology available in the world today. It is clear that bias exists here, and such, leads to a less than acceptable assessment and draft EIR.

Response (23)

Refer to the response to item 22 above.

Your comment (24)

Energy Economics – Only the Facts

OPEN DRAFT FOR COMMENT,

as handed to Minister Gordhan, South African Parliament, Cape Town, 23rd April 2010

Prepared in the interests of a positive energy future for South Africa

We are spending about R140 billion on Medupi coal fired power station, and at least a similar figure if Kusile goes ahead, but coal fired power stations are but one part of the energy future for South Africa. Some members of government would like to see a whole “fleet” of nuclear reactors, with a budget of over R170 billon EACH, implying a minimum budget of R850 billion. All of these costs are only assessments, and as Medupi proved so far, the original estimated cost of some R40 billion has escalated to over R130 billion. Similarly, worldwide, nuclear power plants are all over budget and delayed, with the current one being built in Finland 50% over budget already, and it is only half built.

To check the truth of the economics of nuclear power, and what may be possible with sustainable energy, this document begins to see a more balanced financial picture, than the biased, limited or non-existent financial information being provided currently. The paucity of decent and comparative economic information in the current Environmental Impact Assessment for Nuclear 1 is a case in point.

[Please remember that this document does NOT include: fuel costs and the health costs attached to the life of the fuels (coal and nuclear), from mining, (and energy intensive enrichment in the case of nuclear); the need for large amounts of water; to air, water and soil pollution, and most of all, does not include the deaths and impacts on the health of the South African people. Neither does it include end of life decommissioning, nor does it include the hundreds of thousands of years of nuclear radioactive waste handling. It would be wise to remember that both coal and nuclear generate far more climate changing greenhouse gases than the alternatives.]

At this important energy decision making point in our history, we must take decisions that benefit the largest number of South Africans, while harming none.

Nothing less will do. The world and our children are watching

Response (24)

Your letter to Minister Pravin Gordhan is noted.

Should you have any queries with respect to the above please do not hesitate to contact Arcus GIBB.

Yours faithfully
For Arcus GIBB (Pty) Ltd

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Jaana-Maria Ball
Nuclear-1 EIA Manager