S7: Nuclear - IRP 2010 Input Parameter

Parameter	**Nuclear**
Parameter Value	The EPRI costs and capacity values will be used in the IRP model, including lead times of ten years. The EPRI costs do not include decommissioning costs (or costs relating to the storage of spent fuel) for the nuclear plant. This number needs to be confirmed before including in the IRP model. The IRP will include a nuclear fleet scenario to assess the impact of a nuclear fleet, rather than individual projects. The EPRI report includes the costs for the six unit option which equates to the nuclear fleet.
Rationale	

Responses to Public Inputs

Summary of specific comments	Response
There seems to be a bias toward nuclear, which implies there isn't a level playing field for all generation options (90x2030, ELA)	Noted.
The nuclear parameter seems to exclude certain external costs specific to nuclear power, such as security, regulation, short and long-term waste storage and decommissioning (90x2030, CJN!-WC, ELA, Energy Caucus, SAWEA, Windlab Developments SA)	Noted.
The risks of a nuclear accident are not calculated but need to be included. (90x2030)	Noted. The risks associated with technology options will be considered as one of the criteria in assessing the different scenario outcomes.
There should be a factsheet on coal, not just renewable energy and nuclear. (90x2030, CJN-WC)	Noted.
Issues regarding the primary energy (uranium) supply need to be considered, and possibly added as a separate information sheet. (Chamber of Mines)	Noted.
Information regarding existing agreements/commitments for nuclear development with companies or other governments should be disclosed. (CJN!-WC)	Noted.
The decision for/against nuclear capacity should not be the result of a "government aspiration" to develop a nuclear industry. It should come out of the IRP2 process. It is worrying that the government appears to have already decided on nuclear, regardless of what comes out of the IRP2 process. (CJN!-WC)	Government policy on nuclear and renewable energy should be treated similarly in the IRP. The IRP will provide information on the impact of government policy in terms of capacity choices.
A standard modular design should be chosen and a fleet approach should be adopted as this supports a sustainable construction sector and upgrades skills but greatest value can only be extracted if CSDP approach is also adopted. (Coega Development Corporation)	Noted.
Anchor needed for national grid in EC and EC is also new demand centre (Coega Development Corporation)	Noted.
The long lead-time associated with nuclear provides an opportunity to confirm the role and potential of a massive scale roll-out of CSP tower capacity, and the opportunity to validate the technology as a viable substitute to coal and nuclear base-load. (CSP Developers)	Noted.
There appears to be no reason why the possible economy of scale cost savings of a "fleet" of nuclear plants cannot be equally applied to a "fleet" of CSP tower plants (CSP Developers).	Noted.

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	It is not clear what is meant by nuclear build from 2020 to 2027. Construction of 11.5GWe over such a short period is not economically efficient and does not result in sustainable use nuclear resources. (DoE)	Noted.
	Nuclear cannot be considered as an IPP at this stage and has to be considered as SOE build. (DoE TTT)	The IRP does not consider ownership. This is determined in the feasibility assessment post-IRP.
	There is a lack of data on the costs. This is inexcusable as Eskom tendered for a new PWR in 2008, and those tender bids provide a base for CAPEX costs on nuclear. DoE to make public the results and costs in Eskom's tender process for a new PWR in 2008. (ELA)	The generic nuclear costs derived from the EPRI report will be used in the IRP. The actual costs from the Eskom tender process may not be appropriate for future nuclear capacity.
	On full life cycle terms, nuclear power is not a carbon neutral technology and seems to do worse than all the renewable technologies. A literature review indicated wide variations in the figure for nuclear technology ranging from 1.4gCO2e/kWh to 288gCO2e/kWh with a mean value of 66gCO2e/kWh. (ELA)	Noted.
	The amount of nuclear generation will either be determined by (a) an optimum generation mix or (b) a "nuclear scenario" or fleet strategy. Cost estimates will be based on international "benchmarks." This parameter shows muddled thinking in contrast to the previous parameter discussions. Any decision made should be on the basis of optimum generation mix including emissions constraints and not on the basis of an "aspiration" for a "nuclear scenario". (Energy Caucus)	Noted. Government policy on nuclear and renewable energy should be treated similarly in the IRP. The IRP will provide information on the impact of government policy in terms of capacity choices.
	There was very little debate regarding the nuclear policy (June 2008). In its favour, the policy commits the government to do a full life cycle cost calculation "based on the full nuclear fuel cycle, including decommissioning and decontamination as well as waste disposal". We now expect this to be done. (Energy Caucus)	Noted.
	Necsa strongly recommends that a fleet approach is followed in the acquisition of nuclear reactors. This can be expected to lead to significant cost and localisation advantages over the lifetime of the plants. Operational licences of 2nd generation nuclear power plants are commonly extended to 60 years, while third generation reactors have a design life of 60 years (which may be extended to 80 years). (NECSA)	Noted. The generic life span of 60 years is used for the generic nuclear option.
	A nuclear programme will introduce the possibility of a uranium fuel cycle industry from mining via conversion, enrichment and fuel fabrication to reprocessing and waste disposal. In addition, a fleet approach raises the possibility of local manufacture of much of the plant. A spin-off benefit will be enhanced levels of technology and technical expertise throughout South African industry. (NIASA)	Noted.
	The cost from international benchmarks must be used circumspectly as the benchmarks may not be accurate. Various prices have been supplied by the press with large variations for some power plants in the US over the 2008-2009 period. Caution must be taken that only the nuclear vendors can provide accurate costs of the reactors. (NIASA)	Noted. For the purposes of the IRP generic costs derived from EPRI have been used.
	The building of the nuclear fleet should begin earlier than 2020 which would benefit the country from a CO2 reduction and economic standpoint. (NIASA)	Noted. Feasible timelines have been determined as part of the nuclear policy process. These will be used in the IRP models.
	No nuclear fleet scenario included for revision 1, only an objective of a nuclear fleet of 11,5 GW built 2020-2027. Is this correct? (Private-AR)	Yes. There was no nuclear fleet scenario included in Revision 1. The policy-adjusted IRP included a nuclear fleet strategy however.
	The base scenario do not include nuclear but includes Medupi, Kusile and Ingula. Nuclear is only scenario 5. Is this correct? (Private-AR)	The base scenario includes Medupi, Kusile and Ingula as committed plant (with some sensitivities on project delays or cancellation). Nuclear options are included as options for future build along with renewable options and other technologies (including coal).
	Practically, for the moment, there is no alternative to replace coal-fired base-load plant, other than nuclear. (Private-BM)	Noted.
	Energy generation through nuclear power is environmentally friendly. Statistics indicate the high safety record of nuclear power. (Private-HR)	Noted.

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	Contamination from radioactive emissions in the vicinity of nuclear power stations can impact human health by entering the food chain, even from 'permitted levels of radioactive waste'. The fleet rollout could impact SA farming land and consequently export of agricultural products. This is nothing compared to the damage from a nuclear waste accident (including risks associated with the transport of nuclear waste). (Private-JB)	Noted. These risks will be included in the portfolio risk assessment arising from the scenario outcomes.
	A standard technology and design should be adopted to optimise cost. (Private-WB)	Noted.
	The cost of a dedicated backup as per nuclear regulation requirement needs to be included in the model. (SAWEA)	Noted.
	Nuclear locks SA into a pathway that involves training engineers and technicians, building infrastructure, importing technology, etc. Enormous debt will be incurred. The jobs that will be created require a high level of skills and will thus be at a level that the majority of South Africans can't take up. (SusActMov)	Noted.
	Potential EIA delays should be added to the nuclear input parameter. (Windlab Developments SA)	Noted. All lead times include an expectation of EIA processes and timelines.