Discount Rate: IRP 2010 Input Parameter Data Sheet

This sheet is to be used as the primary stakeholder engagement tool. This document provides the information that will allow the stakeholders to make a meaningful contribution to the IRP Input parameters

Parameter	Discount Rate
Purpose	The discount rate is a critical factor influencing any analysis of economic effects over time. Discount rates effectively express a time preference for money – money right now is preferred to money in the future. Yet in another perspective, high-rates literally discount future expenditure, and hence costs to be borne by future generations.
Impact on the IRP	The discount rate is an important factor in determining the optimal expansion plan due to the manner in which costs of the generation technologies are reflected in the modeling (see lifecycle costs of generation sheet). Under a high discount rate, capital-intensive projects would be penalised (relative to less capital-intensive projects) as the capital costs are incurred upfront and operating and fuel costs incurred during the life-time of the projects. Heavy discounting of these future costs relative to the capital would result in the model favouring low capital projects with higher operating and fuel costs. EG of an impact: Renewable generation tend to have high upfront costs, but low operating costs these would be penalized by a high discount rate. Additionally the costs of decommissioning plant is neglible with high discount rates.
Parameter Value	The real discount rate is based on the Eskom pre-tax WACC of 10,3%.

		2008 Real
Risk free rate	**Rf**	**2.5%**
Country risk		**1.5%**
Debt premium	**Dp**	**3.3%**
Gearing	**g**	**60%**
Equity Beta	**B**	**1.1**
Equity Risk Premium	**ERP**	**6.0%**
Tax rate	**T**	**28.0%**
Inflation	**I**	**7.0%**
Cost of debt	Kd	7.3%
Cost of Equity	Ke	10.6%
WACC (no-tax)		8.6%
WACC (post-tax)		7.39%
WACC (pre-tax)		**10.3%**

These factors need to be seriously considered in light of the serious impact that discounting will have..

Range of Parameter Value

Analyses considering the long-term future (as with the LTMS process) should include consideration of a range of discount rates, including lower ones. Two factors need to be taken into account. 'For mitigation effects, the country must base its decisions at least partly on discount rates that reflect the opportunity cost of capital. … In developing countries the rate could be as high as 10%–12%' (IPCC 2001: 466).

These rates do not reflect private rates of return, typically between 10% and 25%. The second perspective is based on equity in a long-term context. Weitzman (1998) surveyed 1700 professional economists and found that (a) economists believe that lower rates should be applied to problems with long time horizons, such as that being discussed here, and (b) they distinguish between the immediate and, step by step, the far distant future. The discount rate implied by the analysis falls progressively, from 4% to 0%, as the perspective shifts from the immediate (up to 5 years hence) to the far distant future (beyond 300 years).

Good practice is to consider more than one rate, to provide

	policymakers with some guidance on how sensitive the results are to the choice of discount rate. 'A lower rate based on the ethical considerations is, as noted above, around 3%' (IPCC 2001: 467). For this IRP, sensitivity analysis will be conducted on discount rates at different levels, e.g. 15%, 10%, 3% and 0%.
Parameter Owner (Source)	National Treasury / DPE
	• Impacts on Generation lifecycle costs (decommissioning costs) • Impacts on Generation Mix • LTMS: 0-4% Carbon Costs
Preconditions	Decisions makers understand the impact discount rate has on technology choices, funding and ownership.
Assumptions included in establishing the parameter values in this sheet	Different discount rates can be used in alternative technologies