S8: Imports - IRP 2010 Input Parameter

Parameter	Imports
Parameter Value	The following options will be included in the Base Case as options from which the model may select:

	Mphanda Nkuwa	HCB North	Mmamabula
	Hydro	Hydro	Coal
Capacity	1125MW	850MW	1200MW
Life of programme	60	60	30
Lead time	9	9	5
Load factors (%)	66,7%	38%	85%
Variable O&M (R/MWh)	0	12,1	18
Fixed O&M (R/kW/a)	344	69,8	379
Variable Fuel costs (R/GJ)	N/A	N/A	15
Fixed fuel costs (R/kW/a)	N/A	N/A	-
Overnight capital costs (R/kW)	15518	7256	16880
Phasing in capital spent (% per year)	5%, 5%, 5%, 5%, 10%, 25%, 20%, 20%, 5%	5%, 5%, 5%, 5%, 10%, 25%, 20%, 20%, 5%	10%, 25%, 45%, 20%
Equivalent Avail	92	90	91,7
Maintenance	4	5	4,8
Unplanned outages	4	5	3,7
Water usage, l/MWh	-	-	100
Sorbent usage, kg/MWh	-	-	0
CO2 emissions (kg/MWh)	-	-	924,4
SOx emissions (kg/MWh)	-	-	8,93
NOx emissions (kg/MWh)	-	-	2,26
Hg (kg/MWh)	-	-	1,22E-06
Particulates (kg/MWh)	-	-	0,12
Fly ash (kg/MWh)	-	-	166,4
Bottom ash (kg/MWh)	-	-	3,28

The following options will be included in the Regional Development Scenario as options from which the model may select:

	Boroma (Quedas Ocua)	Moatize, Benga	Kafue	Itezhi Tezhi	Kariba North bank extension	Kudu
	Hydro	Coal	Hydro	Hydro	Hydro	Gas
Capacity	160MW	1000MW	750MW	120MW	360MW	711MW

IRP INPUT PARAMETERS

Life of programme	60	30	60	60	60	30
Lead time	4	5	8	3	4	5
Load factors (%)	42%	N/A	46%	64%	38%	N/A
Variable O&M (R/MWh)	12,1	7,7	12,1	12,1	12,1	0
Fixed O&M (R/kW/a)	69,8	160	69,8	69,8	69,8	168
Variable Fuel costs (R/GJ)	N/A	2,88	N/A	N/A	N/A	74,4
Fixed fuel costs (R/MW/a)	N/A	-	N/A	N/A	N/A	-
Overnight capital costs (R/kW)	15152	14400	6400	9464	4264	5780
Phasing in capital spent (% per year)	10%, 25%, 45%, 20%	10%, 25%, 45%, 20%	5%, 5%, 5%, 5%, 10%, 25%, 25%, 20%	15%, 55%, 30%	10%, 25%, 45%, 20%	40%, 50%, 10%
Equivalent Avail	90	91,7	90	90	90	88,8
Maintenance	5	4,8	5	5	5	6,9
Unplanned outages	5	3,7	5	5	5	4,6
Water usage, l/MWh	-	100	-	-	-	12,8
Sorbent usage, kg/MWh	-	0	-	-	-	-
CO2 emissions (kg/MWh)	-	924,4	-	-	-	376
SOx emissions (kg/MWh)	-	8,93	-	-	-	0
NOx emissions (kg/MWh)	-	2,26	-	-	-	0
Hg (kg/MWh)	-	1,22E-06	-	-	-	0
Particulates (kg/MWh)	-	0,12	-	-	-	0
Fly ash (kg/MWh)	-	166,4	-	-	-	0
Bottom ash (kg/MWh)	-	3,28	-	-	-	0

Rationale

Regional projects are not treated as generic. Since many of these are either hydro or gas, there are local considerations that significantly change the costs of the plant (particularly hydro). Thus these options are identified specifically. The cost values used in the modelling are based on commercially sensitive negotiated prices, and thus will not be published. The results of the IRP will not identify specific projects, but assume a generic input from the region.

The costs and other parameters were derived from the SAPP Pool plan, which used 2006 USD. These costs were escalated by (an assumed) 8% to get to 2010 USD, and then R7.40/USD at Jan 2010. Some of these costs have been replaced with the EPRI generic numbers which are more up to date, and with Eskom project numbers where specific values were available.

Responses to Public Inputs

Summary of specific comments	Response
Demand from outside SA should be satisfied dynamically and not included in the Demand Forecast. (90x2030, CJN!-WC)	Noted. The existing export demand is assumed to be constant through the time period. From an IRP planning perspective it may be prudent to only allow for exports where capacity has been built. If additional exports are required these should cover the costs of additional capacity to meet it.
What is the assumed maximum allowable import quantity and how was this figure arrived at? (90x2030, CJN!-WC)	No import limit has been included in the IRP.
No value is given for importing power. There is no timeline for the projects given on the first page. (ACMP)	The projects identified above with associated lead times are included in the IRP as options.

IRP INPUT PARAMETERS

	The parameter sheet provides very limited guidance as to how potential import options will be assessed and analysed compared to 'domestic' South African options. (CIC)	The import options are project-based (and not generic), in which we attempt to include the costs of networks and losses to the border.
	Presumably all listed projects are in other countries They are therefore a long way from the Eastern Cape. The CCGT project that was championed by the DoE would assist with EC base-load/Mid-merit. Since one of the Government policy objectives is to have a diverse generation mix, imported Natural Gas (i.e. LNG) should be considered as an alternative electricity source. (Coega Development Corporation)	Noted.
	Potential for importing CSP power from neighbouring countries, with preferable lead times to other alternatives, as well as preferential rates to REFIT (CSP Developers)	Noted.
	Specific mention of the SAPP markets (incl the DAM) should be made, which should not be limited to the existing utilities (creating space for private participation in the market). (IES)	Noted.
	Demand forecasts are not taking DAM into account, which allows users to assess energy needs within 24 hours (IES)	Noted. Export demand over the long term is uncertain and the assumption has been that current exports are maintained until capacity is available to provide additional. This underlines the inherent difficulty of developing a central IRP relative to a free market mechanism with short term fluctuations.
	Imported energy should only be from renewable sources (Mbani Wesizwe)	Noted. All the listed projects above are included as options, and other policy objectives would determine the preferred options arising from the scenarios.
	A strategy of an integrated and mutually dependent approach to the supply of electricity within the Southern African region is supported. Such interdependence will encourage stability and growth in the region. A national uranium resource strategy must be adopted soonest due to increased international demand for uranium resources. (NECSA)	Noted.
	Long term political stability in the region is an issue (Private-WB)	Noted.
	Transmission losses across the region are significant and should be considered in the model (Private-WB, SAWEA)	Noted.
	The political risk of relying on imports needs to be quantified In the evaluation, including fuel risks arising from affordability concerns in neighbouring states. (SAWEA)	Noted. This will be included in the risk analysis as part of the criteria assessment.
	Currency risk must be factored into the model as well as foreign requirements on increased electricity consumption and therefore the increasing lack of import capacity. (SAWEA)	Noted. This currency risk does not only apply to imported generation as it would also apply to all technologies that relied on imported equipment. Import options will be signed through a PPA which determines the imported energy and capacity.