

4.4 需要想定のおとめ

需要想定の方法は4.2でのべたマクロ的な想定と4.3でのべたミクロ的な想定のおつがある。これらの比較をTable 4.12に示す。マクロ想定値は純粹に需要対の値であり損失を含まない。ミクロ想定は配電用変電所地点の計測値なので11kVフイダーおよび低圧線損失を含まれている。そのため後者の想定値が少し大きくなるのは当然である。その差はTable 4.12の2010年で見るとDar es Salaam 4.4%、Arusha 6.9%、Moshi 10.3%となる。TANESCOの正確な配電損失電力は不明であり系統全体の損失は15~20%の間にあるといわれている。配電損失はこれから数%少ないことを考慮すればマクロ想定、ミクロ想定のお者はほぼ合致していると言つて差し支えないだろう。

Table 4.12 マクロ想定結果とミクロ想定結果の比較 (2010年、MW)

	Macro Forecast (From GDP)	Micro Forecast (From Substation Load)
	Max. Demand	Max Power
Dar es Salaam	475.2	495.9
Arusha	79.7	85.2
Moshi	53.4	58.9

Source

Table 4.5

Table 4.6, 4.8 and 4.10

将来の変電所容量を決定する需要想定値は上述の理由からマクロ想定より数%高めのミクロ想定値を採用した。具体的な3都市の変電所容量を決定する数値はそれぞれTable 4.7, 4.9, 4.11となる。

Annex 4.1

Energy Sales and Number of Customers

Grid System (Developing Grid)

Year	Residential Commercial Lt. Industrial 1	Low Voltage Supply 2	High Voltage Supply 3	Public Lighting 4	Zanzibar 5	Total	Total Low & High Voltage 2 + 3
Energy Consumption (kW.h)							
1980	212,277,436	308,594,559	40,377,098	4,355,440	13,469,000	679,073,533	348,971,657
1981	224,236,971	304,471,462	42,187,522	4,293,397	25,180,000	600,369,352	346,658,984
1982	237,730,543	290,289,885	45,285,177	3,547,176	27,920,000	604,772,781	335,575,062
1983	214,960,000	290,431,000	47,014,000	3,363,000	32,125,000	587,893,000	337,445,000
1984	228,174,163	286,826,960	51,809,597	2,071,788	34,535,000	603,417,568	338,636,557
1985	260,852,020	332,188,151	64,843,496	3,478,372	39,266,000	700,628,039	397,031,647
1986	307,586,633	167,267,840	302,846,626	2,988,909	41,587,000	822,277,008	470,114,466
1987	347,413,030	180,092,423	288,870,734	3,466,496	48,784,700	868,627,383	468,963,157
1988	426,997,379	232,126,770	288,443,709	3,809,432	54,441,000	1,005,818,290	520,570,479
1989	471,691,914	234,683,888	333,815,727	5,071,320	64,298,000	1,109,560,849	568,499,615
1990	575,659,341	255,379,341	364,701,664	6,613,659	52,011,000	1,254,365,005	620,081,005
1991	634,224,543	279,038,624	398,488,970	7,226,373	56,829,000	1,375,807,509	677,527,594
1992	682,963,853	255,105,703	365,683,876	10,061,396	60,099,000	1,373,913,828	620,789,579
1993	710,459,406	247,220,068	336,623,032	8,698,111	68,337,000	1,371,337,617	583,843,100
1994	762,520,250	279,259,957	292,792,504	9,177,906	54,045,400	1,397,798,017	572,052,461
1995	851,437,281	268,156,088	329,845,991	6,365,423	83,560,525	1,539,365,308	590,002,079
1996	1,019,088,977	284,698,984	325,312,656	2,836,957	85,700,333	1,717,638,107	610,011,840
1997	924,805,897	343,903,737	369,697,095	2,388,229	95,004,000	1,735,798,958	713,600,832
1998	974,004,426	385,235,293	358,298,990	1,007,737	103,807,000	1,822,353,446	743,534,283
Number of Consumers							
1980	69,566	582	89	-	1	90,238	671
1981	93,342	608	96	-	1	94,047	704
1982	98,037	611	106	-	1	98,755	717
1983	103,859	634	111	-	1	104,605	745
1984	108,464	725	112	792	1	110,094	837
1985	124,788	698	154	859	1	126,500	852
1986	101,440	453	74	1,083	1	103,051	527
1987	109,490	467	78	1,157	1	111,193	545
1988	126,987	502	81	1,338	1	128,909	583
1989	142,050	549	90	1,530	1	144,220	639
1990	152,972	572	91	1,645	1	155,281	663
1991	168,783	587	90	2,007	1	171,468	677
1992	198,082	849	102	2,259	1	201,293	951
1993	222,969	1,035	105	1,930	1	226,040	1,140
1994	234,491	943	133	1,952	1	237,520	1,076
1995	232,767	983	149	107	1	234,007	1,132
1996	253,570	757	99	124	1	254,551	858
1997	326,623	1,206	126	681	1	328,637	1,332
1998	345,503	1,225	145	521	1	347,395	1,370
Consumption per Consumer (kW.h)							
1980	2,370	530,231	453,675	-	13,469,000	6,417	520,077
1981	2,402	500,775	439,453	-	25,180,000	6,384	492,413
1982	2,425	475,106	427,219	-	27,920,000	6,124	468,027
1983	2,070	458,093	423,550	-	32,125,000	5,620	452,946
1984	2,104	395,623	462,586	2,616	34,535,000	5,481	404,584
1985	2,090	475,914	421,062	4,049	39,266,000	5,539	466,000
1986	3,032	369,245	4,092,522	2,760	41,587,000	7,979	892,058
1987	3,173	385,637	3,703,471	2,996	48,784,700	7,812	860,483
1988	3,363	462,404	3,561,033	2,847	54,441,000	7,803	892,917
1989	3,321	427,475	3,709,064	3,315	64,298,000	7,694	889,671
1990	3,763	446,467	4,007,711	4,020	52,011,000	8,078	935,265
1991	3,758	475,364	4,427,655	3,601	56,829,000	8,024	1,000,779
1992	3,448	300,478	3,585,136	4,454	60,099,000	6,825	652,776
1993	3,186	238,860	3,205,934	4,507	68,337,000	6,067	512,143
1994	3,252	296,140	2,201,447	4,702	54,045,400	5,885	531,647
1995	3,658	272,794	2,213,731	59,490	83,560,525	6,578	528,270
1996	4,019	376,088	3,285,988	22,879	85,700,333	6,748	712,631
1997	2,831	285,161	2,934,104	3,507	95,004,000	5,282	535,736
1998	2,819	314,478	2,471,028	1,934	103,807,000	5,246	542,726

* - Effective March 1986 Heavy Industrial & Large Commercial are billed by Voltage Level.

** - Effective March 1995 Tariffs 1, 2 & 3 are combined as T1; Tariff 4, 4A & 8 as T2; Tariffs 5 & 5A as T3, Tariff 6 as T4 and Tariff 9 as T5.

Annex 4.2.1 - New Industry - Base Assumptions

Grid Branch	Location	Industry	Request (kW)	OnLine Date	In-Plant Coincid Factor	Load Factor	System Peak Coincid Factor	Growth Code (1=Grow)	Existing Plant (1=Yes)	Ignore Requests below:			Peak at System Peak	Maximum Energy (MWh)
										Reduced List (1=Yes)	Effective Load (kW)	600 kW		
1	Moshi	Kibo Breweries	800	2003	0.70	0.45	1.0	1	1	1	560	560	2,207.5	
2	Moshi	K.C.M.C Hospital	400	2000	0.70	0.45	1.0	1	1	1	0	0	0.0	
3	Tanga	Ziggi Bottlers	500	1999	0.70	0.45	1.0	1	1	1	350	350	1,379.7	
4	Tanga	Pe Pee Textile (T) Ltd.	800	2000	0.70	0.45	1.0	1	1	1	560	560	2,207.5	
5	Tanga	Regional Water Supply	448	2001	0.70	0.45	0.0	1	1	1	0	0	0.0	
6	Tanga	Tanzania Cordage Ltd	400	2001	0.70	0.45	1.0	1	1	1	0	0	0.0	
7	Arusha	Seed Oil Producing Plant	1,000	2000	0.70	0.45	1.0	1	0	1	700	700	2,759.4	
8	Arusha	Milling Factory	500	1999	0.70	0.45	1.0	1	0	1	350	350	1,379.7	
9	Mbeya	Mbeya Textile Mill	1,000	2002	0.70	0.45	1.0	1	1	1	700	700	2,759.4	
10	Iringa	Tansico & Kangesa Timber Saw I	800	2001	0.70	0.45	1.0	1	0	1	560	560	2,207.5	
11	Iringa	Water supply - Morogoro rd.	600	2000	0.70	0.60	0.0	1	1	1	420	0	2,207.5	
12	Morogoro	Matombo	1,000	2003	0.70	0.45	1.0	1	0	1	700	700	2,759.4	
13	Morogoro	Mtibwa Sugar	660	2000	0.70	0.45	1.0	1	1	1	602	602	2,373.1	
14	Iringa	Villages along Kihansi - Ir. line	2,000	2001	0.70	0.35	1.0	1	0	1	1,400	1,400	4,292.4	
15	Iringa	Sao Hill Timber	500	2000	0.70	0.45	1.0	1	1	1	350	350	1,379.7	
16	Morogoro	Mtibwa Sugar	660	2002	0.70	0.45	1.0	1	1	1	482	482	1,821.2	
17	Iringa	Njombe	400	2001	0.70	0.45	1.0	1	0	1	0	0	0.0	
18	Tanga	Handeni	424	2001	0.70	0.45	1.0	1	0	1	0	0	0.0	
19	Iringa	Njombe	560	1999	0.70	0.35	1.0	1	1	1	392	392	1,201.9	
20	Arusha	Babati	2,207	2000	0.70	0.35	1.0	1	0	1	1,545	1,545	4,736.7	
21	Arusha	Babati	1,464	2001	0.70	0.35	1.0	1	0	1	1,025	1,025	3,142.0	
22	Arusha	Babati	1,252	2000	0.70	0.35	1.0	1	0	1	876	876	2,687.0	
23	Arusha	Mbulu	600	2000	0.70	0.35	1.0	1	0	1	420	420	1,287.7	
24	Tanga	Lushoto	778	1999	0.70	0.35	1.0	1	0	1	545	545	1,669.7	
25	Arusha	Kiteto	1,012	2001	0.70	0.35	1.0	1	0	1	708	708	2,172.0	
26	Tanga	Lushoto	778	2001	0.70	0.45	1.0	1	0	1	545	545	2,146.8	
27	Moshi	Hai	1,000	2002	0.70	0.45	1.0	1	0	1	700	700	2,759.4	
28	Tukuyu	Chunya	800	2000	0.70	0.45	1.0	1	0	1	560	560	2,207.5	
29	Moshi	Moshi	500	2000	0.70	0.45	1.0	1	1	1	350	350	1,379.7	
30	Musoma	Bunda	680	2000	0.70	0.45	1.0	1	0	1	476	476	1,876.4	
31	Dar es Salaam	Dar es Salaam	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0	
32	Dar es Salaam	Dar es Salaam	960	2000	0.70	0.45	1.0	1	1	1	672	672	2,649.0	
33	Dar es Salaam	Dar es Salaam	1,200	2000	0.70	0.45	1.0	1	0	1	840	840	3,311.3	
34	Dar es Salaam	Dar es Salaam	500	2000	0.70	0.45	1.0	1	1	1	350	350	1,379.7	
35	Dar es Salaam	Dar es Salaam	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0	
36	Dar es Salaam	Dar es Salaam	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0	
37	Dar es Salaam	Dar es Salaam	510	2000	0.70	0.35	1.0	1	1	1	357	357	1,094.6	
38	Dar es Salaam	Dar es Salaam	400	1999	0.70	0.45	1.0	1	1	1	0	0	0.0	
39	Dar es Salaam	Dar es Salaam	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0	
40	Dar es Salaam	Dar es Salaam	3,088	2000	0.70	0.45	1.0	1	1	1	2,162	2,162	8,521.0	
41	Dar es Salaam	Dar es Salaam	2,000	2000	0.70	0.60	1.0	1	0	1	1,400	1,400	7,358.4	
42	Dar es Salaam	Dar es Salaam	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0	
43	Dar es Salaam	Dar es Salaam	1,500	2000	0.70	0.60	1.0	1	0	1	1,050	1,050	5,518.8	

Annex 4.2.2 New Industry - Base Assumptions

Grid Branch	Location	Industry	Request (kW)	OnLine Date	In-Plant Coincid Factor	Load Factor	System Peak Coincid Factor	Ignore Requests below:					Peak at System Peak	Maximum Energy (MWh)
								Growth Code (1=Grow)	Existing Plant (1=Yes)	Reduced List (1=Yes)	Effective Load (kW)	500 kW		
44	Dar es Salaam	Dar es Salaam	Saafa Plastics Ltd	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
45	Dar es Salaam	Dar es Salaam	Bora Industries	400	2000	0.70	0.45	1.0	1	1	1	0	0	0.0
46	Dar es Salaam	Dar es Salaam	A-1 Product(JV Group)	800	2000	0.70	0.60	1.0	1	1	1	560	560	2,943.4
47	Dar es Salaam	Dar es Salaam	Mapato & Mafuta Houses	1,440	2000	0.70	0.45	1.0	1	0	1	1,008	1,008	3,973.5
48	Dar es Salaam	Dar es Salaam	Bandari	1,600	2000	0.70	0.45	1.0	1	1	1	1,120	1,120	4,415.0
49	Dar es Salaam	Dar es Salaam	S.S Bakharesa	4,000	2000	0.70	0.45	1.0	1	0	1	2,800	2,800	11,037.6
50	Dar es Salaam	Dar es Salaam	Gapco (T) Ltd	400	2000	0.70	0.45	1.0	1	1	1	0	0	0.0
51	Dar es Salaam	Dar es Salaam	Meridian Shipping Co.	400	2000	0.70	0.60	1.0	1	1	1	0	0	0.0
52	Dar es Salaam	Dar es Salaam	Oilcom (T) Ltd & Nacoil Co. Ltd	800	2000	0.70	0.35	1.0	1	0	1	560	560	1,717.0
53	Dar es Salaam	Dar es Salaam	Amadori - Vikindu	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
54	Shinyanga	Maswa	Cargil Cotton Ginners	950	2000	0.70	0.45	1.0	1	1	1	665	665	2,621.4
55	Shinyanga	Shinyanga	Kahama Cotton Ginnery	459	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
56	Shinyanga	Bariadi	Bariadi Water Supply	1,680	2000	0.70	0.45	0.0	1	1	1	1,176	0	4,635.8
57	Shinyanga	Bariadi	Somaia Group Ginnery	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
58	Shinyanga	Shinyanga	Industrial Area	492	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
59	Shinyanga	Kahama	Oil Mill	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
60	Shinyanga	Kahama	Cargil Cotton Ginnery	418	2001	0.70	0.45	1.0	1	0	1	0	0	0.0
61	Shinyanga	Meatu	Rural Electrification	1,330	2000	0.70	0.35	1.0	1	0	1	931	931	2,854.4
62	Arusha	Arusha	New Impala	1,500	2000	0.70	0.45	1.0	1	0	1	1,050	1,050	4,139.1
63	Arusha	Simanjiro	Mererani (Domestic)	1,750	2002	0.70	0.45	1.0	1	0	1	1,225	1,225	4,829.0
64	Arusha	Simanjiro	Mererani (Mining)	2,000	2005	0.70	0.45	1.0	1	0	1	1,400	1,400	5,518.8
65	Arusha	Simanjiro	Mererani - Mbuguni	1,000	2000	0.70	0.45	1.0	1	0	1	700	700	2,759.4
66	Arusha	Monduli	Namanga Township -Tz Side	714	2000	0.70	0.45	1.0	1	0	1	500	500	1,970.2
67	Arusha	Monduli	Namanga Township - Kenya side	900	2001	0.70	0.45	1.0	1	0	1	630	630	2,483.5
68	Arusha	Karatu	Rural Electrification	1,584	2000	0.70	0.45	1.0	1	0	1	1,109	1,109	4,370.9
69	Arusha	Karatu	Serena Hotel	483	1999	0.70	0.45	1.0	1	0	1	0	0	0.0
70	Dodoma	Dodoma	Water Supply and Sewerage	4,000	2001	0.70	0.60	0.0	1	1	1	2,800	0	14,716.8
71	Dodoma	Dodoma	Gairo Township	640	2000	0.70	0.45	1.0	1	0	1	448	448	1,766.0
72	Dodoma	Kondoa	Rural Electrification	952	2000	0.70	0.45	1.0	1	0	1	666	666	2,626.9
73	Mbeya	Mbeya	Mbalali Rice Farm	1,000	2002	0.70	0.45	1.0	1	0	1	700	700	2,759.4
74	Mbeya	Kyela	Ipinda village	400	2000	0.70	0.35	1.0	1	0	1	0	0	0.0
75	Mbeya	Lujewa	Lujewa Township & settlements	400	2002	0.70	0.35	1.0	1	0	1	0	0	0.0
76	Mbeya	Mbeya	New forest area	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
77	Musoma	Musoma	Fish Processing	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
78	Musoma	Musoma	Musoma Diary	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
79	Musoma	Musoma	Musoma Textile	1,600	2002	0.70	0.45	1.0	1	1	1	1,120	1,120	4,415.0
80	Musoma	Musoma	Prime catch Ltd(Fish)	1,200	2000	0.70	0.45	1.0	1	0	1	840	840	3,311.3
81	Musoma	Bunda	Bulamba Ginnery	480	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
82	Musoma	Bunda	Virian (T) Ginnery & Oil Mills	1,600	2000	0.70	0.45	1.0	1	0	1	1,120	1,120	4,415.0
83	Musoma	Bunda	Ushashi Ginnery	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
84	Musoma	Bunda	Township	800	2000	0.70	0.45	1.0	1	0	1	560	560	2,207.5
85	Musoma	Musoma	Musoma Water Supply	600	2003	0.70	0.60	0.0	1	1	1	420	0	2,207.5
86	Musoma	Bunda	Kibara Township	960	2000	0.70	0.45	1.0	1	0	1	672	672	2,649.0

Annex 4.2.3 New Industry - Base Assumptions

Grid Branch	Location	Industry	Request (kW)	OnLine Date	In-Plant Coincid Factor	Load Factor	System Peak Coincid Factor	Ignore Requests below: 1000 kW					
								Growth Code (1=Grow)	Existing Plant (1=Yes)	Reduced List (1=Yes)	Effective Load (kW)	Peak at System Peak	Maximum Energy (MWh)
87 Musoma	Tarime	Sirari To Kenya	1,600	2000	0.70	0.45	1.0	1	0	1	1,120	1,120	4,415.0
88 Musoma	Bunda	Rural Electrification	770	2000	0.70	0.35	1.0	1	0	1	539	539	1,652.6
89 Musoma	Bunda	Bunda Hospital	0	1999	0.70	0.45	1.0	1	1	1	0	0	0.0
90 Musoma	Bunda	Bunda Booster Pump	412	2000	0.70	0.45	0.0	1	0	1	0	0	0.0
91 Musoma	Bunda	Butiama Irrigation	400	2001	0.70	0.45	0.0	1	1	1	0	0	0.0
92 Musoma	Bunda	Manyamanyama Hospital	460	2001	0.70	0.45	1.0	1	1	1	0	0	0.0
93 Musoma	Serengeti	Mugumu Electrification	1,200	2005	0.70	0.35	1.0	1	0	1	840	840	2,575.4
94 Musoma	Tarime	Nyangoto Village	510	2001	0.70	0.35	1.0	1	0	1	357	357	1,094.6
95 Musoma	Bunda	Ecofish Ltd	1,200	2000	0.70	0.45	1.0	1	1	1	840	840	3,311.3
96 Musoma	Butiama	Butiama Expansion	1,000	2000	0.70	0.45	1.0	1	1	1	700	700	2,759.4
97 Mwanza	Mwanza	Beach Hotel- Nyegezi	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
98 Mwanza	Mwanza	Majige Hotel	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
99 Mwanza	Mwanza	Mwanza Water Supply	2,800	2002	0.70	0.60	0.0	1	1	1	1,960	0	10,301.8
100 Mwanza	Mwanza	Tanganyika Bus Oil Mill	400	2000	0.70	0.45	1.0	1	0	1	0	0	0.0
101 Mwanza	Magu	Aquva Ginnery And Oil Mills	400	1999	0.70	0.45	1.0	1	1	1	0	0	0.0
102 Mwanza	Magu	Aquva Sugar & Irrigation Projects	2,400	2004	0.70	0.45	1.0	1	0	1	1,680	1,680	6,622.6
103 Mwanza	Ukerewe	Rural Electrification	1,200	2001	0.70	0.35	1.0	1	0	1	840	840	2,575.4
104 Mwanza	Geita	Cop Kot Ginnery	504	2001	0.70	0.45	1.0	1	0	1	353	353	1,390.7
105 Mwanza	Geita	Kasamwa Ginnery	504	2001	0.70	0.45	1.0	1	0	1	353	353	1,390.7
106 Mwanza	Magu	Bun-Luge stone quarry	576	2002	0.70	0.45	1.0	1	0	1	403	403	1,589.4
107 Mwanza	Geita	Rural Electrification	640	2001	0.70	0.35	1.0	1	0	1	448	448	1,373.6
108 Mwanza	Mwanza	Mwanza Municipal Distr. Expan.	2,880	1999	0.70	0.35	1.0	1	1	1	2,016	2,016	6,181.1
109 Mwanza	Magu	Ngasamo ginnery	504	2001	0.70	0.45	1.0	1	0	1	353	353	1,390.7
110 Mwanza	Magu	Aquva Ginnery and Oil Mill	400	2001	0.70	0.45	1.0	1	0	1	0	0	0.0
111 Tabora	Nzega	Manonga Ginnery	1,000	2001	0.70	0.45	1.0	1	0	1	700	700	2,759.4
112 Tabora	Igunga	Township	1,200	2001	0.70	0.45	1.0	1	0	1	840	840	3,311.3
113 Tabora	Nzega	Lusu (Golden Pride) Mine	3,000	1999	0.70	0.45	1.0	0	1	1	2,100	2,100	8,278.2
114 Shinyanga	Kahama	Kahama Gold Mine-Bulyanhulu	15,000	2001	0.70	0.45	1.0	0	0	1	10,500	10,500	41,391.0
115 Musoma	Tarime	Nyabirama & Nyabigena Mine	12,800	2002	0.70	0.45	1.0	0	0	0	8,960	8,960	35,320.3
116 Shinyanga	Shinyanga	Nyaligongo (Golden Ridge) Mine	6,000	2004	0.70	0.45	1.0	0	0	0	4,200	4,200	16,556.4
117 Shinyanga	Ngara	Kabanga Nickel	35,000	2005	0.70	0.45	1.0	0	0	0	24,500	24,500	96,579.0
118 Mwanza	Geita	Buckreef, Rwamagaza Mine	8,000	2003	0.70	0.45	1.0	0	0	0	5,600	5,600	22,075.2
119 Mwanza	Geita	Nyankanga mine (Ashanti)	35,000	2002	0.70	0.45	1.0	0	0	0	24,500	24,500	96,579.0
120 Shinyanga	Kahama	Mwime (Chocolate Reef) Mine	13,000	2005	0.70	0.45	1.0	0	0	0	9,100	9,100	35,872.2
121 Shinyanga	Mwadui	Williamson Diamond	1,000	2000	0.70	0.45	1.0	1	1	0	700	700	2,759.4
122 Tabora	Tabora	AFRITAN Minerals	400	2001	0.70	0.45	1.0	1	0	0	0	0	0.0
123 Morogoro	Morogoro	Mtibwa Sugar	660	2004	0.70	0.45	1.0	1	1	1	462	462	1,821.2
124 Morogoro	Morogoro	Fruit Canning Factory	400	2002	0.70	0.45	1.0	1	0	1	0	0	0.0
999 XXXX	XXXX	End of List - Do Not Erase											
Gross Total			233,833		125						152,430	145,654	600,104

Annex 4.3
Grid System (MW.h)

Reference Case

	Actual 1998	[Reduced Industrial List]															
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt Indust	974,004	1,082,510	1,187,262	1,302,098	1,427,721	1,565,193	1,715,437	1,887,365	2,009,915	2,139,081	2,273,825	2,413,772	2,559,759	3,386,240	4,400,285	5,844,890	7,172,995
Identified Rural Electrification	0	0	4,254	4,655	5,116	5,608	6,146	6,691	7,202	7,664	8,146	8,645	9,172	12,133	15,766	20,226	25,701
TOTAL GENERAL USE (MWh)	974,004	1,082,510	1,191,516	1,306,753	1,432,836	1,570,741	1,721,583	1,874,048	2,017,117	2,146,745	2,281,772	2,422,421	2,568,930	3,398,373	4,416,051	5,865,116	7,198,696
Annual Growth Rate		11.1%	10.1%	9.7%	9.5%	9.6%	9.5%	9.5%	7.6%	6.4%	6.3%	6.2%	6.0%	5.8%	5.4%	5.1%	4.5%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	743,422	771,404	808,245	842,539	880,337	919,707	960,712	1,003,424	1,047,912	1,094,262	1,142,621	1,192,800	1,245,174	1,541,663	1,905,482	2,351,987	2,900,220
Miscellaneous Industrial	112	112	112	112	112	112	112	117	122	128	133	139	145	180	222	276	339
New Industrial Loads - Full Growth	0	9,779	33,577	139,390	202,978	230,219	252,332	283,550	276,235	287,406	300,084	313,290	327,046	404,924	500,476	617,753	761,745
New Industrial Loads - Low Growth	0	8,278	8,278	22,075	36,872	49,889	49,889	48,719	49,587	55,964	71,074	71,074	71,074	71,074	71,074	71,074	71,074
TOTAL INDUSTRIAL (MWh)	743,534	789,573	898,815	1,004,116	1,119,298	1,199,707	1,282,825	1,316,810	1,373,238	1,437,749	1,513,811	1,577,302	1,643,439	2,017,860	2,477,254	3,041,096	3,733,377
Annual Growth Rate		6.2%	13.8%	11.3%	11.5%	7.2%	6.3%	4.3%	4.3%	4.7%	5.3%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
PUBLIC LIGHTING	1,008	1,478	1,945	2,413	2,882	3,351	3,819	4,288	4,758	5,225	5,693	6,000	6,319	8,124	10,340	13,059	16,398
Annual Growth Rate		46.5%	31.7%	24.1%	19.4%	15.3%	14.0%	12.3%	10.9%	9.9%	9.0%	8.4%	8.3%	5.2%	4.9%	4.8%	4.7%
BULK SALES	103,807	111,708	123,134	133,455	144,712	156,732	167,282	178,732	189,921	200,835	211,795	223,420	235,829	304,082	358,194	491,429	616,179
Annual Growth Rate		7.6%	10.2%	8.4%	8.4%	7.6%	7.4%	6.9%	6.3%	5.6%	5.6%	5.6%	5.4%	5.2%	5.0%	4.8%	4.7%
TOTAL CONSUMPTION	1,822,353	1,985,268	2,215,110	2,446,748	2,699,727	2,929,529	3,155,480	3,373,878	3,585,031	3,790,355	4,013,072	4,229,143	4,454,217	5,728,440	7,291,838	9,210,703	11,566,652
Annual Growth Rate		8.9%	11.6%	10.5%	10.3%	8.5%	7.7%	6.9%	6.2%	5.7%	5.9%	5.4%	- 5.3%	5.2%	4.9%	4.8%	4.7%
LOSSES																	
Technical Losses*	-	199,220	208,778	211,556	215,455	233,828	251,843	269,295	286,148	302,837	320,314	337,580	355,525	457,230	582,017	735,176	923,222
Loss Rate (%)	-	8.5%	8.0%	7.8%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	169,384	162,838	163,981	163,133	177,041	190,698	203,694	216,635	229,064	242,523	255,581	269,183	346,189	440,670	556,633	699,011
Loss Rate (%)	-	8.8%	6.9%	6.8%	5.9%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	270,225	368,604	369,516	375,337	378,589	410,869	442,539	473,168	502,804	531,600	562,837	593,141	624,708	803,419	1,022,687	1,291,809	1,622,233
Total Loss Rate (%)	12.9%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION	2,092,579	2,343,862	2,584,725	2,822,085	3,078,367	3,340,398	3,598,039	3,847,065	4,087,834	4,321,945	4,576,908	4,822,284	5,078,924	6,531,859	8,314,525	10,502,512	13,188,885
Annual Growth Rate		12.0%	10.3%	9.2%	9.1%	8.6%	7.7%	6.9%	6.3%	5.7%	5.9%	5.4%	5.3%	5.2%	4.9%	4.8%	4.7%
CONTRIBUTION TO SYSTEM PEAK (MW) (Including losses)																	
General Use @ 65.0%	196.4	224.5	243.3	263.8	285.9	313.4	343.5	374.0	402.5	428.4	455.3	483.4	512.6	678.1	881.2	1130.5	1436.5
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.9	5.1	6.5	8.4
Identified Existing Industrial @ 65.0%	149.9	190.0	185.2	170.7	176.3	184.2	192.4	200.9	209.9	219.1	228.8	238.9	249.4	308.7	381.5	471.0	580.8
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
New Industrial Loads - Full Growth		3.8	23.5	33.7	51.3	58.9	65.1	68.0	71.0	74.1	77.4	80.8	84.3	104.4	129.1	159.3	195.5
New Industrial Loads - Low Growth		2.5	2.5	6.5	10.4	14.4	14.4	14.4	14.5	18.2	20.8	20.8	20.8	20.8	20.8	20.8	20.8
Public Lighting @ 65.0%	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.6	2.1	2.6	3.3
Bulk Sales @ 65.0%	20.9	23.2	25.2	27.0	29.0	31.2	33.5	35.8	38.0	40.2	42.4	44.7	47.2	60.9	77.7	98.4	123.8
TOTAL PEAKLOAD	367.5	414.0	461.5	505.7	555.1	604.8	651.7	698.1	739.2	781.6	828.3	872.4	918.3	1178.4	1497.4	1889.0	2359.8
EFFECTIVE LOAD FACTOR	0.660	0.646	0.639	0.637	0.633	0.633	0.630	0.631	0.631	0.631	0.631	0.631	0.631	0.633	0.634	0.635	0.635

Annex 4.4

Grid System (MW.h)

High Case

	Actual 1998	[Full Industrial List]															
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt. Indust	974,004	1,062,000	1,198,815	1,328,215	1,472,279	1,632,454	1,810,556	1,996,948	2,178,992	2,346,926	2,523,603	2,710,478	2,907,027	4,053,393	5,529,072	7,423,915	9,875,161
Identified Rural Electrification	0	0	4,254	4,714	5,225	5,794	6,428	7,087	7,726	8,328	8,967	9,620	10,317	14,386	19,623	26,266	35,048
TOTAL GENERAL USE (MWh)	974,004	1,062,000	1,202,869	1,332,929	1,477,504	1,638,247	1,816,984	2,004,035	2,184,718	2,354,252	2,532,580	2,720,098	2,917,344	4,067,779	5,548,695	7,450,181	9,910,209
Annual Growth Rate		11.1%	11.2%	10.8%	10.8%	10.9%	10.9%	10.3%	9.0%	7.6%	7.5%	7.4%	7.3%	6.9%	6.4%	6.1%	5.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	743,422	771,404	815,188	851,192	909,509	960,509	1,014,054	1,070,369	1,129,698	1,191,852	1,257,411	1,326,321	1,398,798	1,821,519	2,365,675	3,066,240	3,968,292
Miscellaneous Industrial	112	112	112	112	112	112	112	118	125	132	139	147	155	201	262	339	439
New Industrial Loads - Full Growth	0	9,779	86,636	142,149	205,869	234,892	259,461	273,870	289,025	304,964	321,727	339,359	357,903	466,063	605,293	784,544	1,015,347
New Industrial Loads - Low Growth	0	8,278	8,278	22,075	79,839	162,319	220,200	220,200	221,822	248,106	315,093	315,093	315,093	315,093	315,093	315,093	315,093
TOTAL INDUSTRIAL (MWh)	743,534	789,573	910,193	1,023,529	1,195,419	1,347,833	1,493,827	1,564,778	1,640,270	1,745,083	1,894,371	1,980,620	2,071,950	2,602,877	3,288,323	4,166,216	5,299,171
Annual Growth Rate		6.2%	15.3%	12.7%	15.6%	12.7%	10.8%	4.7%	4.8%	6.4%	8.8%	4.8%	4.6%	4.7%	4.8%	4.9%	4.9%
PUBLIC LIGHTING																	
Annual Growth Rate	1,008	1,571	2,134	2,698	3,261	3,824	4,387	4,951	5,514	6,077	6,640	7,202	7,764	10,008	13,253	17,432	22,614
Annual Growth Rate		55.9%	35.9%	26.4%	20.9%	17.3%	14.7%	12.8%	11.4%	10.2%	9.3%	8.2%	7.4%	6.0%	5.8%	5.6%	5.5%
BULK SALES																	
Annual Growth Rate	103,807	241,878	124,348	136,120	149,088	162,184	176,131	190,508	204,853	219,957	233,791	249,393	265,803	361,513	484,716	643,333	847,558
Annual Growth Rate		7.8%	11.3%	9.5%	8.6%	8.6%	8.6%	8.2%	7.5%	6.9%	6.8%	6.7%	6.6%	6.3%	6.0%	5.8%	5.7%
TOTAL CONSUMPTION																	
Annual Growth Rate	1,822,353	1,964,823	2,229,541	2,497,278	2,825,272	3,152,068	3,491,327	3,764,271	4,035,355	4,324,379	4,667,363	4,957,463	5,262,581	7,042,174	9,332,987	12,282,262	16,079,762
Annual Growth Rate		8.9%	12.8%	11.0%	13.1%	11.6%	10.8%	7.8%	7.2%	7.2%	7.9%	6.2%	6.2%	6.0%	5.8%	5.6%	5.5%
LOSSES																	
Technical Losses*	-	198,185	209,059	216,027	225,508	251,592	278,589	300,455	322,092	345,181	372,637	395,893	420,040	562,089	744,936	980,340	1,283,447
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	159,348	184,634	187,061	170,741	190,491	210,992	227,487	243,870	261,336	282,064	299,596	318,035	425,582	564,023	742,258	971,753
Loss Rate (%)	-	6.8%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	270,225	358,534	373,892	383,088	396,247	442,083	489,682	527,942	565,962	606,498	654,802	695,288	738,082	987,671	1,308,959	1,722,598	2,255,200
Total Loss Rate (%)	12.9%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
Annual Growth Rate	2,092,579	2,343,358	2,613,234	2,880,384	3,221,519	3,594,171	3,980,889	4,292,214	4,601,317	4,930,577	5,321,964	5,652,751	6,000,663	8,029,845	10,641,947	14,004,880	18,334,963
Annual Growth Rate		12.0%	11.5%	10.2%	11.8%	11.8%	10.8%	7.6%	7.2%	7.2%	7.9%	6.2%	6.2%	6.0%	5.8%	5.6%	5.5%
CONTRIBUTION TO SYSTEM PEAK (MW)																	
(including losses)																	
General Use @ 65.0%	195.4	224.4	245.6	269.1	294.8	326.9	362.8	398.9	436.0	469.8	505.4	542.8	582.2	811.7	1107.3	1457.7	1977.6
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.6	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.4	4.7	6.4	8.5	11.4
Identified Existing Industrial @ 65.0%	149.9	160.0	167.1	174.5	182.2	192.4	203.1	214.4	226.2	238.7	251.8	265.8	280.1	364.8	473.8	614.1	794.7
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
New Industrial Loads - Full Growth		3.6	24.3	38.5	52.1	60.2	67.1	70.8	74.7	78.9	83.2	87.8	92.5	120.5	156.6	202.9	262.6
New Industrial Loads - Low Growth		2.5	2.5	6.0	23.1	44.1	63.7	64.1	63.8	64.1	71.3	91.1	91.1	91.1	91.1	91.1	91.1
Public Lighting @ 65.0%	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	2.0	2.7	3.5	4.6
Bulk Sales @ 65.0%	20.9	23.2	25.5	27.8	29.9	32.5	35.3	38.2	41.0	43.8	46.8	49.9	53.2	72.4	97.1	128.8	169.7
TOTAL PEAK LOAD	367.5	413.9	468.8	516.2	564.4	612.7	661.1	710.3	759.3	808.9	858.6	908.2	957.8	1241.3	1587.3	2034.8	2611.8
EFFECTIVE LOAD FACTOR	0.650	0.646	0.639	0.637	0.629	0.623	0.619	0.620	0.621	0.621	0.618	0.619	0.620	0.625	0.628	0.630	0.632

Annex 4.5 Grid System (MW.h)

Low Case

	Actual 1998	[Reduced Industrial List]															
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030	
GENERAL USE ENERGY																	
Residential, Small Comm & Lt Indust	974,004	1,040,875	1,097,351	1,156,090	1,217,179	1,280,706	1,346,773	1,418,099	1,491,065	1,565,837	1,642,599	1,722,030	1,804,014	2,255,270	2,784,324	3,405,058	4,133,887
Identified Rural Electrification	0	0	4,254	4,482	4,719	4,963	5,221	5,497	5,780	6,082	6,365	6,676	6,933	8,743	10,794	13,200	16,025
TOTAL GENERAL USE (MWh)	974,004	1,040,875	1,101,605	1,160,571	1,221,897	1,285,671	1,351,993	1,423,597	1,496,845	1,571,706	1,648,967	1,728,706	1,811,007	2,264,013	2,795,118	3,418,258	4,149,913
Annual Growth Rate		6.9%	5.8%	5.4%	5.3%	5.2%	5.2%	5.3%	5.1%	5.0%	4.9%	4.8%	4.8%	4.6%	4.3%	4.1%	4.0%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	743,422	762,488	787,806	813,930	840,885	868,700	897,403	927,022	957,589	989,134	1,021,691	1,055,292	1,089,973	1,280,865	1,504,667	1,767,252	2,075,563
Miscellaneous Industrial	112	112	112	112	112	112	112	116	120	124	128	132	136	160	188	221	259
New Industrial Loads - Full Growth	0	9,373	71,382	116,923	167,850	201,348	236,990	244,812	252,884	261,214	269,812	278,686	287,844	338,256	397,258	466,703	548,123
New Industrial Loads - Low Growth	0	8,278	8,278	24,835	33,113	41,391	49,669	49,719	49,967	65,964	71,074	71,074	71,074	71,074	71,074	71,074	71,074
TOTAL INDUSTRIAL (MWh)	743,534	780,251	887,579	955,800	1,041,971	1,111,552	1,184,173	1,221,668	1,260,560	1,306,436	1,362,705	1,405,184	1,449,027	1,690,355	1,973,287	2,305,249	2,695,019
Annual Growth Rate		4.9%	11.2%	10.2%	9.0%	6.7%	6.8%	3.2%	3.2%	3.6%	4.3%	3.1%	3.1%	3.1%	3.1%	3.2%	3.2%
PUBLIC LIGHTING																	
	1,008	1,359	1,710	2,061	2,412	2,763	3,114	3,465	3,816	4,167	4,518	4,701	4,890	5,932	7,153	8,585	10,267
Annual Growth Rate		34.8%	25.8%	20.3%	17.0%	14.6%	12.7%	11.3%	10.1%	9.2%	8.4%	4.1%	4.0%	3.9%	3.8%	3.7%	3.6%
BULK SALES																	
	103,807	106,666	118,084	121,964	128,382	134,929	141,481	147,468	153,717	160,245	166,982	173,925	181,112	220,813	268,925	321,262	385,062
Annual Growth Rate		4.7%	6.6%	5.1%	5.2%	5.1%	4.9%	4.2%	4.2%	4.2%	4.2%	4.2%	4.1%	4.0%	3.9%	3.8%	3.7%
TOTAL CONSUMPTION																	
	1,822,353	1,931,150	2,086,978	2,240,416	2,394,651	2,534,914	2,680,761	2,796,198	2,914,938	3,042,554	3,183,171	3,312,526	3,446,036	4,180,913	5,042,463	6,053,355	7,240,251
Annual Growth Rate		6.0%	8.1%	7.4%	6.9%	6.9%	5.8%	4.3%	4.2%	4.4%	4.6%	4.1%	4.0%	3.9%	3.8%	3.7%	3.6%
LOSSES																	
Technical Losses*	-	193,799	194,817	193,604	191,136	202,331	213,972	223,186	232,663	242,849	254,073	264,398	275,054	333,710	402,479	483,164	577,900
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	155,039	153,418	149,878	144,717	153,193	162,007	168,963	176,159	183,672	192,369	200,187	208,255	252,666	304,734	369,824	437,553
Loss Rate (%)	-	8.6%	8.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	270,225	348,838	348,236	343,683	335,853	355,524	376,979	392,169	408,823	426,721	446,442	464,585	483,310	586,377	707,213	848,988	1,015,453
Total Loss Rate (%)	12.9%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
	2,092,579	2,279,988	2,435,214	2,584,101	2,730,515	2,890,438	3,056,740	3,188,367	3,323,761	3,469,275	3,629,613	3,777,111	3,929,346	4,767,290	5,749,695	6,902,343	8,255,714
Annual Growth Rate		9.0%	6.8%	5.1%	5.7%	5.9%	5.8%	4.3%	4.2%	4.4%	4.6%	4.1%	4.0%	3.9%	3.8%	3.7%	3.6%
CONTRIBUTION TO SYSTEM PEAK (MW) (Including losses)																	
General Use @ 65.0%	196.4	215.8	224.9	234.2	243.8	255.5	268.7	284.0	298.6	313.5	329.0	344.9	361.3	451.6	557.8	681.9	827.9
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.8	3.5	4.3	5.2
Identified Existing Industrial @ 65.0%	149.9	158.1	161.4	164.9	168.4	174.0	179.7	185.6	191.6	198.1	204.6	211.3	218.3	256.5	301.3	353.9	415.7
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
New Industrial Loads - Full Growth		3.3	19.7	29.1	40.8	50.2	60.9	62.9	64.9	67.1	69.3	71.6	73.9	88.9	102.0	119.9	140.5
New Industrial Loads - Low Growth		2.5	2.5	7.3	9.8	12.0	14.4	14.4	14.5	16.2	20.6	20.6	20.6	20.6	20.6	20.6	20.6
Public Lighting @ 65.0%	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.2	1.4	1.7	2.1
Bulk Sales @ 65.0%	20.9	22.6	23.8	24.7	25.7	27.0	28.3	29.6	30.8	32.1	33.4	34.8	36.3	44.2	53.5	64.3	77.1
TOTAL PEAKLOAD	367.5	402.7	434.1	462.1	490.3	521.9	556.3	578.9	603.2	629.8	659.8	689.3	713.8	863.8	1040.0	1246.6	1489.3
EFFECTIVE LOAD FACTOR																	
	0.600	0.648	0.640	0.638	0.638	0.632	0.632	0.629	0.629	0.629	0.628	0.628	0.629	0.630	0.631	0.632	0.633

Annex 4.6

Energy Sales and Number of Customers

Dar es Salaam

Year	Residential Commercial Lt. Industrial 1	Low Voltage Supply 2	High Voltage Supply 3	Public Lighting 4	Zanzibar 5	Total ^{1,2,3,4,5}	Total Low & High Voltage 2 + 3
Energy Consumption (kW.h)							
1980	149,571,700	194,524,298	32,680,000	3,054,229	13,469,000	393,299,227	227,204,298
1981	158,659,854	189,470,238	34,720,700	2,572,964	25,180,000	410,603,756	224,190,938
1982	167,216,808	184,673,500	35,379,175	2,429,675	27,920,000	417,619,158	220,052,675
1983	146,269,000	175,719,000	36,927,000	2,177,000	32,125,000	393,217,000	212,646,000
1984	155,085,000	175,059,077	37,317,825	698,658	34,535,000	402,695,560	212,376,900
1985	159,904,455	188,887,529	41,757,033	1,893,622	39,266,000	431,708,639	230,644,562
1986	187,662,415	83,552,078	142,676,276	1,220,069	41,587,000	456,697,836	226,228,352
1987	203,238,906	116,485,614	132,332,323	1,495,478	48,784,700	502,337,019	248,817,937
1988	239,924,500	118,192,119	132,379,556	1,430,484	54,441,000	546,367,659	250,571,675
1989	247,528,988	121,346,968	135,824,774	1,934,537	64,298,000	570,933,267	257,171,742
1990	298,857,792	129,986,558	158,596,971	2,644,524	52,011,000	642,096,845	288,583,529
1991	326,685,079	142,028,892	173,289,979	2,889,522	56,829,000	701,722,571	315,318,970
1992	348,458,768	118,004,711	147,200,711	6,196,609	60,099,000	677,959,799	263,205,422
1993	361,430,608	103,544,976	126,099,825	4,386,517	68,337,000	663,798,926	229,644,801
1994	401,903,420	118,252,796	120,928,550	3,852,187	54,045,400	696,982,353	237,181,346
1995	403,625,922	108,718,518	131,037,481	1,674,378	83,560,525	726,616,822	237,755,997
1996	492,821,224	135,170,870	129,057,578	555,650	85,700,333	843,305,655	284,228,448
1997	452,445,995	198,031,285	171,901,894	576,237	95,004,000	915,959,411	367,933,179
1998	518,768,302	243,002,412	213,121,841	508,583	103,807,000	1,079,268,138	456,124,253
Number of Consumers							
1980	62,944	132	80	-	1	63,157	212
1981	65,707	136	85	-	1	65,929	221
1982	69,076	144	87	-	1	69,308	231
1983	71,942	154	90	-	1	72,187	244
1984	73,571	156	90	451	1	74,269	246
1985	75,370	159	94	457	1	76,081	253
1986	55,337	248	34	387	1	56,007	282
1987	57,607	264	37	394	1	58,303	301
1988	63,166	273	37	453	1	63,930	310
1989	66,289	289	43	509	1	67,131	332
1990	68,764	285	41	522	1	69,613	326
1991	77,774	291	40	879	1	78,985	331
1992	79,885	271	45	577	1	80,779	316
1993	90,349	300	49	607	1	91,306	349
1994	98,137	314	48	561	1	99,061	362
1995	100,589	404	62	21	1	101,076	468
1996	107,259	153	7	14	1	107,434	160
1997	138,291	453	66	38	1	138,849	519
1998	145,674	505	80	42	1	146,302	585
Consumption per Consumer (kW.h)							
1980	2,378	1,473,669	408,500	-	13,469,000	6,227	1,071,718
1981	2,415	1,393,184	408,479	-	25,180,000	6,228	1,014,439
1982	2,421	1,282,455	406,657	-	27,920,000	6,026	952,609
1983	2,033	1,141,032	410,300	-	32,125,000	5,447	871,500
1984	2,108	1,122,174	414,643	1,549	34,535,000	5,422	863,321
1985	2,122	1,187,972	444,224	4,144	39,266,000	5,674	911,639
1986	3,391	336,904	4,196,361	3,153	41,587,000	8,154	802,228
1987	3,528	441,233	3,576,549	3,796	48,784,700	8,616	828,638
1988	3,798	432,938	3,577,826	3,158	54,441,000	8,546	808,296
1989	3,734	419,886	3,158,716	3,801	64,298,000	8,505	774,614
1990	4,346	456,093	3,868,219	5,066	52,011,000	9,224	885,226
1991	4,200	488,072	4,332,249	3,287	56,829,000	8,884	952,625
1992	4,362	428,062	3,271,127	10,739	60,099,000	8,393	832,929
1993	4,000	345,150	2,573,466	7,227	68,337,000	7,270	658,008
1994	4,095	370,232	2,519,345	6,867	54,045,400	7,036	655,197
1995	4,013	264,155	2,113,508	79,732	83,560,525	7,189	510,206
1996	4,595	883,470	18,436,797	39,689	85,700,333	7,850	1,651,428
1997	3,272	432,740	2,604,574	15,164	95,004,000	6,597	708,927
1998	3,581	481,193	2,684,023	12,109	103,807,000	7,377	779,700

* - Effective March 1988 Heavy Industrial & Large Commercial are billed by Voltage Level.

** - Effective March 1995 Tariffs 1, 2 & 3 are combined as T1; Tariff 4, 4A & 8 as T2; Tariff 5 & 5A as T3, Tariff 6 as T4 and Tariff 9 as T5.

Annex 4.7

Dar es Salaam (MW.h)

Reference Case	Actual 1998	[Reduced Industrial List]															
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt. Indust	518,768	567,131	614,215	665,522	721,340	782,077	848,179	916,785	983,257	1,048,446	1,112,255	1,180,826	1,252,243	1,656,580	2,192,634	2,761,499	3,509,054
Identified Rural Electrification	0	0	4,254	4,809	4,996	5,417	5,874	6,350	6,810	7,248	7,703	8,178	8,673	11,473	14,906	19,126	24,505
TOTAL GENERAL USE (MWh)	518,768	567,131	618,469	670,331	726,336	787,493	854,054	923,134	990,067	1,055,693	1,119,958	1,189,004	1,260,915	1,668,053	2,167,543	2,780,625	3,533,557
Annual Growth Rate		9.3%	9.1%	8.4%	8.4%	8.4%	8.5%	8.1%	7.3%	6.4%	6.3%	6.2%	6.0%	5.8%	5.4%	5.1%	4.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	456,124	473,292	494,671	516,937	540,128	564,283	589,442	615,647	642,943	671,375	700,990	731,839	763,973	945,894	1,169,102	1,443,060	1,779,421
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	0	31,975	42,947	53,919	56,331	58,842	61,458	64,183	67,021	69,978	73,057	76,265	94,426	116,708	144,056	177,634
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	456,124	473,292	526,646	559,984	594,047	620,614	648,284	677,106	707,126	738,396	770,967	804,896	840,237	1,040,320	1,265,810	1,587,116	1,957,055
Annual Growth Rate		3.8%	11.3%	6.3%	6.1%	4.5%	4.5%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.3%	4.3%	4.3%
PUBLIC LIGHTING																	
Annual Growth Rate	509	741	974	1,207	1,440	1,672	1,905	2,138	2,371	2,604	2,836	2,991	3,152	4,063	5,180	6,552	8,236
Annual Growth Rate		45.8%	31.4%	23.9%	19.3%	15.2%	13.9%	12.2%	10.9%	9.8%	8.9%	8.4%	8.4%	5.2%	5.0%	4.8%	4.7%
BULK SALES																	
Annual Growth Rate	103,807	111,708	123,134	133,455	144,712	155,732	167,252	178,732	189,921	200,635	211,795	223,420	235,529	304,082	368,194	491,429	618,179
Annual Growth Rate		7.6%	10.2%	8.4%	8.4%	7.6%	7.4%	6.9%	6.3%	6.6%	6.6%	5.9%	5.4%	5.2%	5.0%	4.8%	4.7%
TOTAL CONSUMPTION																	
Annual Growth Rate	1,079,208	1,152,873	1,269,222	1,364,677	1,466,535	1,566,511	1,671,495	1,781,110	1,889,485	1,995,328	2,105,588	2,220,310	2,339,534	3,016,498	3,846,727	4,865,722	6,116,827
Annual Growth Rate		6.8%	10.1%	7.5%	7.5%	6.7%	6.8%	6.6%	6.1%	5.6%	5.5%	5.4%	5.4%	5.2%	5.0%	4.8%	4.7%
LOSSES																	
Technical Losses*	-	115,696	118,480	118,052	117,055	124,955	133,415	142,164	150,814	159,252	168,061	177,220	186,760	240,770	307,036	389,370	488,230
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	92,557	93,303	91,293	88,628	94,509	101,014	107,638	114,188	120,584	127,246	134,181	141,404	182,297	232,470	294,052	369,660
Loss Rate (%)	-	8.5%	5.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	161,426	208,252	211,784	209,345	205,683	219,564	234,429	249,802	265,002	279,846	295,308	311,400	328,164	423,066	539,507	682,422	857,890
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
Annual Growth Rate	1,240,634	1,361,125	1,481,006	1,574,022	1,672,217	1,785,075	1,905,923	2,030,912	2,164,487	2,275,174	2,400,875	2,531,711	2,667,897	3,439,565	4,388,233	5,548,143	6,974,717
Annual Growth Rate		9.7%	8.6%	6.3%	6.2%	6.7%	6.6%	6.6%	6.1%	5.6%	5.5%	5.4%	5.4%	5.2%	5.0%	4.8%	4.7%
CONTRIBUTION TO SYSTEM PEAK (MW) (Including losses)																	
General Use @ 65.0%	104.8	117.8	125.9	134.8	144.5	156.6	169.9	183.8	196.9	209.6	222.7	236.5	250.8	331.7	431.1	553.0	702.7
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.7	2.8	3.7	4.9	6.2	7.9
Identified Existing Industrial @ 65.0%	92.0	98.1	101.4	104.7	108.2	113.0	118.0	123.3	128.8	134.5	140.4	146.6	153.0	189.4	234.1	289.0	356.4
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.0	0.0	8.1	11.9	14.7	15.3	16.0	16.7	17.3	18.3	19.1	19.9	20.5	25.7	31.8	39.2	48.4
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.8	0.8	1.0	1.3	1.6
Bulk Sales @ 65.0%	20.9	23.2	25.2	27.0	29.0	31.2	33.5	35.8	38.0	40.2	42.4	44.7	47.2	60.9	77.7	98.4	123.8
TOTAL PEAKLOAD	217.8	239.1	253.2	260.2	268.2	318.3	339.7	361.9	383.9	406.3	427.7	450.9	475.2	612.3	760.6	987.2	1240.8
EFFECTIVE LOAD FACTOR	0.651	0.650	0.642	0.641	0.640	0.640	0.640	0.641	0.641	0.641	0.641	0.641	0.641	0.641	0.641	0.642	0.642

Annex 4.8

Dares Salaam (MW.h)

High Case

	Actual 1988	[Full Industrial List]															
	1988	1989	2000	2001	2002	2003	2004	2006	2008	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt Indust	518,768	566,864	619,989	678,822	743,370	814,905	893,868	978,800	1,063,107	1,148,604	1,232,371	1,323,629	1,419,611	1,979,425	2,700,054	3,627,619	4,822,414
Identified Rural Electrification	0	0	4,254	4,858	5,101	5,591	6,134	6,716	7,284	7,880	8,456	9,062	9,741	13,582	18,526	24,892	33,089
TOTAL GENERAL USE (MWh)	518,768	566,864	624,243	683,279	748,471	820,496	900,102	985,516	1,070,402	1,153,464	1,240,827	1,332,711	1,429,352	1,993,006	2,718,581	3,652,711	4,855,502
Annual Growth Rate		9.3%	10.1%	9.5%	9.5%	9.3%	9.7%	9.5%	8.8%	7.8%	7.8%	7.4%	7.3%	6.9%	6.4%	5.1%	5.3%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	456,124	473,292	500,143	526,382	558,081	589,317	622,170	656,721	693,061	731,282	771,480	813,760	858,228	1,117,587	1,451,452	1,881,282	2,434,733
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	0	31,975	42,947	53,919	56,937	60,111	63,449	66,960	70,653	74,537	78,622	82,918	107,976	140,233	181,761	235,233
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	456,124	473,292	532,118	571,329	612,001	646,255	682,281	720,171	760,022	801,935	846,017	892,382	941,146	1,225,564	1,591,885	2,063,043	2,669,965
Annual Growth Rate		3.8%	12.4%	7.4%	7.1%	5.6%	5.6%	5.6%	5.5%	5.5%	5.5%	5.5%	5.5%	5.4%	5.4%	5.3%	5.3%
PUBLIC LIGHTING																	
	509	771	1,033	1,295	1,557	1,819	2,082	2,344	2,606	2,868	3,130	3,393	3,656	4,828	6,465	8,574	11,268
Annual Growth Rate		51.5%	34.0%	25.4%	20.2%	16.8%	14.4%	12.6%	11.2%	10.1%	9.1%	8.6%	8.5%	6.3%	6.0%	5.8%	5.7%
BULK SALES																	
	103,807	111,678	124,346	136,120	149,088	162,184	176,131	190,508	204,853	218,957	233,791	249,393	265,603	361,513	484,716	643,333	847,568
Annual Growth Rate		7.6%	11.3%	9.5%	9.3%	8.8%	8.6%	8.2%	7.5%	6.9%	6.6%	6.7%	6.6%	6.3%	6.0%	5.9%	5.7%
TOTAL CONSUMPTION																	
	1,079,205	1,152,605	1,281,739	1,392,023	1,611,117	1,630,754	1,760,595	1,898,538	2,037,882	2,177,225	2,323,765	2,477,623	2,639,857	3,584,910	4,801,447	6,367,660	8,384,324
Annual Growth Rate		6.8%	11.2%	8.6%	8.6%	7.9%	8.0%	7.8%	7.3%	6.8%	6.7%	6.6%	6.5%	6.3%	6.0%	5.8%	5.7%
LOSSES																	
Technical Losses*	-	115,869	119,849	120,417	120,814	130,163	140,628	151,537	162,859	173,781	185,477	197,774	210,707	286,139	383,240	508,251	669,216
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	92,535	94,224	93,123	91,322	98,652	106,399	114,735	123,156	131,577	140,433	149,743	159,535	216,648	290,167	384,819	506,692
Loss Rate (%)	-	8.8%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	161,426	208,204	213,872	213,640	211,935	228,715	246,925	266,272	285,815	305,358	325,910	347,517	370,242	502,787	673,407	893,070	1,175,909
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
	1,240,634	1,360,809	1,495,611	1,805,563	1,723,052	1,859,468	2,007,520	2,164,610	2,323,697	2,482,582	2,649,676	2,825,340	3,010,099	4,087,697	5,474,854	7,260,730	9,560,232
Annual Growth Rate		9.7%	9.2%	7.4%	7.3%	7.9%	8.0%	7.5%	7.3%	6.8%	6.7%	6.6%	6.5%	6.3%	6.0%	5.8%	5.7%
CONTRIBUTION TO SYSTEM PEAK (MW)																	
(Including losses)																	
General Use @ 65.0%	104.6	117.5	127.1	137.5	148.9	163.2	179.0	196.0	212.9	229.4	246.8	265.1	284.3	396.4	540.7	726.5	965.7
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.7	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	4.4	6.0	8.1	10.8
Identified Existing Industrial @ 65.0%	92.0	98.1	102.5	107.0	111.8	118.0	124.8	131.5	138.6	146.4	154.5	163.0	171.9	223.8	290.7	378.6	487.6
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.0	0.0	9.1	11.9	14.7	15.6	16.4	17.3	18.2	19.2	20.3	21.4	22.6	29.4	33.2	43.5	64.1
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	1.0	1.3	1.7	2.3
Bulk Sales @ 65.0%	20.9	23.2	25.5	27.6	29.9	32.5	35.3	38.2	41.0	43.8	46.8	49.9	53.2	72.4	97.1	128.8	169.7
TOTAL PEAK LOAD	217.6	239.0	285.7	285.8	307.1	321.4	357.7	385.8	413.9	442.1	471.8	503.0	535.9	727.4	974.0	1291.4	1700.2
EFFECTIVE LOAD FACTOR																	
	0.651	0.650	0.642	0.641	0.640	0.641	0.641	0.641	0.641	0.641	0.641	0.641	0.641	0.642	0.642	0.642	0.642

Annex 4.9

Dar es Salaam (MW.h)

Low Case	[Reduced Industrial List]																
	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt. Indust	518,768	545,318	587,741	631,062	675,317	640,539	698,770	867,358	736,785	787,312	805,031	843,980	884,139	1,105,298	1,284,585	1,668,805	2,028,001
Identified Rural Electrification	0	0	4,254	4,429	4,810	4,799	4,996	6,225	5,478	5,749	5,032	6,324	8,825	8,282	10,222	12,504	15,181
TOTAL GENERAL USE (MWh)	518,768	545,318	571,995	595,491	619,927	645,339	671,786	702,581	736,240	773,061	811,063	850,283	890,764	1,113,580	1,374,810	1,681,209	2,041,181
Annual Growth Rate		5.1%	4.9%	4.1%	4.1%	4.1%	4.1%	4.6%	4.8%	5.0%	4.9%	4.8%	4.8%	4.6%	4.3%	4.1%	4.0%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	456,124	467,822	483,358	499,384	515,923	532,988	550,598	568,771	587,526	606,880	626,855	647,471	668,750	785,871	923,184	1,084,292	1,273,455
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	0	27,586	34,169	40,753	47,338	53,919	60,500	67,081	73,662	80,243	86,824	93,405	109,986	126,567	143,148	159,729
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	456,124	467,822	510,942	533,553	558,675	580,324	604,518	624,470	645,061	668,311	688,242	710,877	734,239	882,630	1,013,590	1,190,475	1,398,183
Annual Growth Rate		2.6%	9.2%	4.4%	4.3%	4.2%	4.2%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
PUBLIC LIGHTING	509	653	857	1,031	1,205	1,379	1,553	1,727	1,901	2,075	2,249	2,342	2,435	2,955	3,583	4,308	5,159
Annual Growth Rate		34.2%	25.0%	20.3%	18.0%	14.4%	12.8%	11.2%	10.1%	9.2%	8.4%	4.1%	4.1%	4.0%	3.9%	3.8%	3.7%
BULK SALES	103,807	108,800	116,084	121,984	128,382	134,929	141,481	147,468	153,717	160,245	166,982	173,835	181,112	220,813	268,925	321,282	385,062
Annual Growth Rate		4.7%	6.8%	5.1%	5.2%	5.1%	4.9%	4.2%	4.2%	4.2%	4.2%	4.2%	4.1%	4.0%	3.9%	3.8%	3.7%
TOTAL CONSUMPTION	1,079,208	1,122,488	1,199,878	1,252,059	1,308,189	1,361,971	1,419,317	1,476,246	1,536,919	1,601,682	1,668,536	1,737,436	1,808,553	2,199,988	2,658,907	3,197,553	3,829,585
Annual Growth Rate		4.0%	6.9%	4.3%	4.3%	4.3%	4.2%	4.0%	4.1%	4.2%	4.2%	4.1%	4.1%	4.0%	3.9%	3.8%	3.7%
LOSSES																	
Technical Losses*	-	112,848	112,007	108,310	104,257	106,709	113,288	117,830	122,673	127,843	133,178	138,678	144,354	175,598	212,228	255,205	305,666
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	90,117	88,206	83,759	78,957	82,308	85,774	89,214	92,881	96,796	100,835	104,999	109,297	132,963	160,687	193,227	231,433
Loss Rate (%)	-	8.9%	8.3%	6.8%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%
TOTAL LOSSES	161,428	202,764	200,213	192,069	183,184	191,018	199,060	207,045	215,554	224,639	234,014	243,677	253,651	308,560	372,914	448,432	537,100
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION	1,240,634	1,325,252	1,400,091	1,444,129	1,489,383	1,552,988	1,618,378	1,683,291	1,752,474	1,826,331	1,902,560	1,881,115	2,062,204	2,508,538	3,031,821	3,645,785	4,366,684
Annual Growth Rate		6.8%	5.6%	3.1%	3.1%	4.3%	4.2%	4.0%	4.1%	4.2%	4.2%	4.1%	4.1%	4.0%	3.9%	3.8%	3.7%
CONTRIBUTION TO SYSTEM PEAK (MW) (including losses)																	
General Use @ 65.0%	104.8	113.1	116.4	119.7	123.2	126.3	133.5	139.7	146.3	153.7	161.2	169.0	177.1	221.3	273.3	334.2	405.7
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.5	1.8	1.8	1.7	1.8	1.9	2.0	2.1	2.2	2.7	3.3	4.1	4.9
Identified Existing Industrial @ 65.0%	92.0	97.0	99.1	101.2	103.3	106.7	110.3	113.9	117.7	121.5	125.5	129.7	133.9	157.4	184.9	217.1	255.0
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.0	0.0	7.9	9.8	11.2	12.9	14.7	15.2	15.7	16.2	16.7	17.3	17.8	21.0	24.8	28.9	34.0
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.1	0.4	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.8	0.7	0.9	1.0
Bulk Sales @ 65.0%	20.9	22.5	23.8	24.7	25.7	27.0	28.3	29.5	30.8	32.1	33.4	34.8	36.3	44.2	53.5	64.3	77.1
TOTAL PEAKLOAD	217.8	232.8	248.7	256.8	265.2	276.8	288.7	300.3	312.6	325.8	339.3	353.3	367.7	447.2	540.3	649.5	777.8
EFFECTIVE LOAD FACTOR	0.801	0.850	0.843	0.842	0.841	0.840	0.841	0.841	0.841								

Annex 4.10

Energy Sales and Number of Customers

Arusha

Year	Residential Commercial L.t. Industrial 1	Low Voltage Supply 2	High Voltage Supply 3	Public Lighting 4	Zanzibar 5	Total	Total Low & High Voltage 2 + 3
Energy Consumption (kW.h)							
1980	18,362,484	27,864,498	3,083,822	321,491	-	49,632,295	30,948,320
1981	18,523,459	28,774,648	3,126,056	339,902	-	50,764,065	31,900,704
1982	22,659,598	26,598,228	3,684,538	411,282	-	53,353,646	30,282,766
1983	18,706,000	34,608,000	3,928,000	173,000	-	57,413,000	38,534,000
1984	22,723,728	30,636,283	4,138,970	386,493	-	57,885,474	34,775,253
1985	24,548,957	26,991,144	4,286,305	313,728	-	56,140,134	31,277,449
1986	27,748,409	14,015,866	21,916,292	345,141	-	64,025,708	35,932,158
1987	31,579,288	9,879,247	25,107,853	306,011	-	66,872,397	34,987,100
1988	38,466,177	8,489,663	25,051,590	378,200	-	70,383,720	33,541,253
1989	35,296,361	9,868,644	28,976,956	470,921	-	74,612,781	38,845,599
1990	49,161,301	10,191,291	27,215,168	890,979	-	87,458,739	37,406,459
1991	54,786,785	11,135,450	29,736,481	973,523	-	96,632,239	40,871,931
1992	52,094,381	15,827,509	15,320,935	838,910	-	84,081,735	31,148,444
1993	50,219,149	11,772,995	20,824,130	978,762	-	83,795,036	32,597,125
1994	52,814,485	18,338,338	26,148,809	1,050,266	-	98,351,898	44,487,147
1995	72,079,548	16,975,596	23,371,327	887,194	-	113,313,665	40,346,923
1996	117,498,501	23,181,531	25,507,952	372,069	-	166,560,053	48,689,483
1997	92,809,437	19,102,293	28,136,665	146,010	-	138,194,405	45,238,958
1998	82,813,747	21,928,930	32,675,024	-	-	137,417,701	54,603,954
Number of Consumers							
1980	5,425	22	3	-	-	5,450	25
1981	5,571	22	5	-	-	5,598	27
1982	5,768	22	5	-	-	5,795	27
1983	6,943	25	7	-	-	6,975	32
1984	6,887	26	7	70	-	6,980	33
1985	7,229	29	7	76	-	7,341	36
1986	7,314	31	9	79	-	7,433	40
1987	7,694	29	9	82	-	7,814	38
1988	8,249	29	7	98	-	8,383	36
1989	9,010	32	9	94	-	9,145	41
1990	9,944	31	9	104	-	10,088	40
1991	10,867	26	9	107	-	11,009	35
1992	13,874	43	9	126	-	14,052	52
1993	17,470	51	9	158	-	17,688	60
1994	15,443	47	9	135	-	15,634	56
1995	15,110	51	13	9	-	15,183	64
1996	16,409	64	25	9	-	16,507	89
1997	23,721	118	6	66	-	23,909	122
1998	25,575	117	7	70	-	25,769	124
Consumption per Consumer (kW.h)							
1980	3,385	1,268,568	1,027,941	-	-	9,107	1,237,933
1981	3,325	1,307,939	625,211	-	-	9,068	1,181,508
1982	3,929	1,209,010	736,908	-	-	9,207	1,121,584
1983	2,694	1,384,320	560,857	-	-	8,231	1,204,188
1984	3,300	1,178,319	591,281	5,521	-	8,281	1,053,796
1985	3,396	930,729	612,329	4,128	-	7,647	868,818
1986	3,794	452,125	2,435,144	4,369	-	8,614	898,304
1987	4,104	340,664	2,789,761	3,732	-	8,558	920,713
1988	4,421	292,747	3,578,799	3,840	-	8,396	931,701
1989	3,917	308,395	3,219,662	5,009	-	8,159	947,454
1990	4,944	328,751	3,023,908	8,567	-	8,670	935,161
1991	5,042	428,287	3,304,053	9,098	-	8,778	1,167,769
1992	3,755	368,082	1,702,326	6,858	-	5,984	599,009
1993	2,875	230,843	2,313,792	6,195	-	4,737	543,285
1994	3,420	390,177	2,905,423	7,780	-	6,291	794,413
1995	4,770	332,855	1,797,794	98,577	-	7,463	630,421
1996	7,161	362,211	1,020,318	41,341	-	10,090	547,073
1997	3,913	164,675	4,356,111	2,212	-	5,780	370,811
1998	3,238	187,427	4,687,861	-	-	5,333	440,354

* - Effective March 1988 Heavy Industrial & Large Commercial are billed by Voltage Level.

** - Effective March 1995 Tariffs 1, 2 & 3 are combined as T1; Tariff 4, 4A & 8 as T2; Tariff 5 & 5A as T3, Tariff 6 as T4 and Tariff 9 as T5.

Annex 4.11
Arusha (MW.h)

Reference Case

	Actual 1988	[Reduced Industrial List]															
	1988	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2008	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt Indust	82,814	91,035	99,014	107,727	117,227	127,584	138,877	150,480	161,591	171,975	182,792	194,060	205,796	272,243	353,769	453,831	576,686
Identified Rural Electrification	0	0	4,254	4,628	5,037	5,481	5,967	6,465	6,943	7,389	7,853	8,335	8,842	11,697	15,199	19,498	24,777
TOTAL GENERAL USE (MWh)	82,814	91,035	103,268	112,355	122,263	133,065	144,844	156,945	168,533	179,364	190,646	202,997	214,638	283,940	368,998	473,330	601,463
Annual Growth Rate		9.5%	13.4%	8.8%	8.8%	8.8%	8.9%	8.4%	7.4%	6.4%	5.3%	5.2%	6.0%	5.6%	5.4%	5.1%	4.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	64,604	66,659	59,218	61,884	64,680	67,552	70,584	73,701	76,969	80,372	83,918	87,611	91,457	113,236	139,957	172,753	213,020
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	460	8,157	20,452	32,860	38,338	41,514	43,359	45,282	47,284	49,370	51,543	53,806	66,818	82,339	101,633	125,323
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	64,604	67,119	67,375	82,336	97,520	105,890	112,078	117,060	122,250	127,656	133,287	139,153	145,263	179,854	222,295	274,386	338,342
Annual Growth Rate		4.6%	19.7%	20.4%	18.6%	8.5%	5.8%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.3%	4.3%	4.3%
PUBLIC LIGHTING																	
	0	49	97	146	194	243	292	340	389	437	485	512	540	596	647	1,122	1,410
Annual Growth Rate			100.0%	50.0%	33.3%	25.0%	20.0%	16.7%	14.3%	12.5%	11.1%	5.4%	5.4%	5.2%	5.0%	4.8%	4.7%
BULK SALES																	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Growth Rate																	
TOTAL CONSUMPTION																	
	157,418	148,200	171,740	194,838	220,078	239,198	257,213	274,345	291,172	307,458	324,419	342,063	360,441	464,489	592,150	748,837	941,215
Annual Growth Rate		7.8%	15.9%	13.4%	13.0%	8.7%	7.5%	6.7%	6.1%	5.8%	6.5%	5.4%	5.4%	5.2%	5.0%	4.8%	4.7%
LOSSES																	
Technical Losses*	-	14,873	16,032	18,954	17,568	19,092	20,530	21,898	23,241	24,541	25,894	27,303	28,770	37,074	47,264	59,770	75,125
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	11,898	12,625	13,034	13,300	14,456	15,944	16,580	17,697	18,661	19,806	20,872	21,783	28,071	35,788	45,255	56,881
Loss Rate (%)	-	8.8%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	20,555	26,771	28,657	29,889	30,866	33,548	36,074	38,477	40,837	43,121	45,500	47,975	50,552	65,145	83,050	105,025	132,006
Total Loss Rate (%)	13.1%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
	157,972	174,973	200,396	224,727	250,944	272,746	293,287	312,823	332,010	350,579	369,919	390,037	410,993	529,634	675,200	853,862	1,073,221
Annual Growth Rate		10.8%	14.5%	12.1%	11.7%	8.7%	7.5%	6.7%	6.1%	5.6%	5.5%	5.4%	5.4%	5.2%	5.0%	4.8%	4.7%
CONTRIBUTION TO SYSTEM PEAK (MW)																	
(including losses)																	
General Use @ 65.0%	16.7	18.9	20.3	21.8	23.5	25.8	27.8	30.1	32.4	34.4	36.8	38.9	41.2	64.5	70.8	90.9	115.5
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.6	1.8	1.9	2.1	2.3	2.4	2.6	2.7	2.9	3.8	4.9	6.3	8.1
Identified Existing Industrial @ 65.0%	11.0	11.7	12.1	12.5	12.9	13.5	14.1	14.8	15.4	16.1	16.8	17.5	18.3	22.7	28.0	34.5	42.7
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.1	3.0	6.6	10.5	12.3	13.3	13.8	14.5	15.1	15.8	16.5	17.2	21.3	26.3	32.4	40.0	
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Public Lighting @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3
Bulk Sales @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL PEAKLOAD	27.7	30.8	36.8	42.5	48.8	63.2	67.2	69.9	64.6	68.1	71.8	75.7	79.7	102.4	130.3	164.5	206.5
EFFECTIVE LOAD FACTOR																	
	0.851	0.849	0.821	0.803	0.809	0.858	0.885	0.886	0.887	0.887	0.888	0.888	0.888	0.890	0.892	0.893	0.893

**Annex 4.12
Arusha (MW.h)**

High Case

		[Full Industrial List]															
	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt. Indust	82,814	90,992	99,950	109,862	120,834	132,985	148,445	160,751	174,822	188,288	202,656	217,663	233,447	325,505	444,009	595,575	793,019
Identified Rural Electrification	0	0	4,254	4,676	6,143	6,660	8,233	8,842	7,441	8,018	8,625	9,284	9,936	13,854	18,698	25,391	33,752
TOTAL GENERAL USE (MWh)	82,814	90,992	104,204	114,538	126,977	139,645	156,678	169,593	182,263	196,306	211,282	226,927	243,383	339,359	462,907	621,966	826,771
Annual Growth Rate		9.9%	14.6%	9.9%	10.0%	10.1%	10.1%	8.8%	8.9%	7.6%	7.6%	7.4%	7.3%	6.9%	6.4%	6.1%	5.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	54,604	59,659	59,874	63,254	66,810	70,549	74,482	78,818	82,968	87,544	92,356	97,418	102,741	133,790	173,758	225,214	291,459
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	480	9,157	20,452	32,978	38,649	42,234	44,579	47,045	49,640	52,369	55,239	58,258	75,863	98,527	127,704	165,273
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	54,604	57,119	69,030	83,707	99,785	109,198	116,715	123,197	130,014	137,184	144,725	152,657	160,999	209,653	272,284	352,918	456,742
Annual Growth Rate		4.6%	20.9%	21.3%	19.2%	9.4%	6.9%	5.6%	5.8%	5.5%	5.6%	5.6%	5.9%	5.4%	5.4%	5.3%	5.3%
PUBLIC LIGHTING																	
	0	53	107	180	214	267	320	374	427	481	534	589	607	824	1,103	1,462	1,925
Annual Growth Rate			100.0%	50.0%	33.3%	25.0%	20.0%	16.7%	14.3%	12.5%	11.1%	8.6%	8.6%	6.3%	6.0%	5.8%	5.7%
BULK SALES																	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Growth Rate																	
TOTAL CONSUMPTION																	
	137,418	148,164	173,341	198,404	225,976	248,110	269,714	291,164	312,704	334,071	356,541	380,154	404,988	549,836	726,294	976,348	1,235,438
Annual Growth Rate		7.8%	17.0%	14.5%	13.3%	9.8%	8.7%	8.0%	7.4%	6.8%	6.7%	6.8%	6.8%	6.5%	6.0%	5.8%	5.7%
LOSSES																	
Technical Losses*	-	14,889	16,181	17,163	18,037	19,804	21,528	23,240	24,969	26,665	28,455	30,343	32,325	43,587	58,769	77,930	102,501
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	11,895	12,743	13,273	13,656	14,994	16,300	17,596	18,898	20,189	21,547	22,974	24,475	33,228	44,487	59,004	77,683
Loss Rate (%)	-	6.8%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	20,555	26,784	28,924	30,436	31,693	34,798	37,828	40,836	43,857	48,254	50,005	53,317	56,800	77,115	103,256	136,533	180,284
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
	157,972	174,929	202,264	228,840	257,669	282,908	307,542	332,000	356,561	380,925	406,546	433,470	461,788	626,951	839,559	1,113,279	1,465,722
Annual Growth Rate		10.7%	15.6%	13.1%	12.6%	9.8%	8.7%	8.0%	7.4%	6.8%	6.7%	6.8%	6.8%	6.3%	6.0%	5.8%	5.7%
CONTRIBUTION TO SYSTEM PEAK (MW) (including losses)																	
General Use @ 65.0%	16.7	16.9	20.5	22.3	24.2	26.8	29.3	32.2	35.0	37.7	40.6	43.6	46.8	65.2	88.9	119.5	158.8
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.7	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	4.5	6.1	8.3	11.0
Identified Existing Industrial @ 65.0%	11.0	11.7	12.3	12.8	13.4	14.1	14.9	15.7	16.6	17.5	18.5	19.5	20.6	26.8	34.8	45.1	58.4
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.1	3.0	8.6	10.8	12.4	13.5	14.2	15.0	15.8	16.7	17.6	18.6	24.2	31.5	40.8	52.8	68.8
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4
Bulk Sales @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL PEAK LOAD	27.7	30.8	37.1	43.3	49.8	55.0	59.8	64.5	69.2	73.8	78.7	83.9	89.3	120.9	161.5	213.9	281.3
EFFECTIVE LOAD FACTOR																	
	0.851	0.649	0.622	0.604	0.590	0.587	0.587	0.588	0.589	0.589	0.590	0.590	0.590	0.592	0.593	0.594	0.595

**Annex 4.13
Arusha (MW.h)**

Low Case

	[Reduced Industrial List]																
	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & LI Indust	82,814	87,534	91,520	95,665	99,977	104,461	109,124	114,398	120,019	126,021	132,216	138,810	145,209	161,531	224,116	274,060	332,745
Identified Rural Electrification	0	0	4,254	4,447	4,647	4,856	5,072	5,317	5,579	5,853	6,146	6,443	6,750	8,438	10,417	12,740	15,467
TOTAL GENERAL USE (MWh)	82,814	87,534	95,774	100,112	104,624	109,316	114,196	119,715	125,598	131,879	138,362	145,053	151,958	169,969	234,533	286,820	348,212
Annual Growth Rate		6.7%	9.4%	4.5%	4.5%	4.5%	4.5%	4.5%	4.9%	5.0%	4.9%	4.8%	4.8%	4.8%	4.3%	4.1%	4.0%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	54,604	56,004	57,864	59,783	61,763	63,806	65,914	68,089	70,334	72,651	75,043	77,511	80,058	94,079	110,517	129,804	152,449
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	276	5,494	13,831	23,506	31,249	38,782	40,041	41,362	42,724	44,131	45,582	47,080	55,325	64,992	76,334	89,851
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	54,604	56,280	63,358	73,614	85,268	95,055	104,676	108,131	111,696	115,376	119,173	123,093	127,138	149,404	175,509	206,138	242,100
Annual Growth Rate		3.1%	12.0%	16.2%	15.8%	11.6%	10.1%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
PUBLIC LIGHTING																	
Annual Growth Rate	0	39	77	116	155	193	232	270	309	348	386	402	419	509	615	739	885
Annual Growth Rate			100.0%	50.0%	33.3%	25.0%	20.0%	16.7%	14.3%	12.5%	11.1%	4.1%	4.1%	4.0%	3.9%	3.6%	3.7%
BULK SALES																	
Annual Growth Rate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL CONSUMPTION																	
Annual Growth Rate	137,418	143,852	159,209	173,842	190,047	204,564	219,104	228,116	237,603	247,603	257,921	268,548	279,515	339,883	410,658	493,697	591,198
Annual Growth Rate		4.7%	10.7%	8.2%	9.3%	7.6%	7.1%	4.1%	4.2%	4.2%	4.2%	4.1%	4.1%	4.0%	3.9%	3.8%	3.7%
LOSSES																	
Technical Losses*	-	14,436	14,862	15,038	15,169	16,328	17,488	18,208	18,968	19,763	20,587	21,435	22,310	27,129	32,778	39,406	47,168
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	11,549	11,704	11,630	11,485	12,362	13,241	13,788	14,359	14,963	15,587	16,229	16,882	20,540	24,817	29,836	35,728
Loss Rate (%)	-	8.6%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	20,555	25,985	26,566	26,666	26,654	28,690	30,729	31,994	33,324	34,726	36,174	37,664	39,202	47,669	57,595	69,241	82,916
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
Annual Growth Rate	157,972	169,838	185,775	200,509	216,701	233,255	249,833	260,110	270,927	282,329	294,095	306,212	318,717	387,551	468,253	562,939	674,114
Annual Growth Rate		7.5%	9.4%	7.9%	8.1%	7.6%	7.1%	4.1%	4.2%	4.2%	4.2%	4.1%	4.1%	4.0%	3.9%	3.8%	3.7%
CONTRIBUTION TO SYSTEM PEAK (MW)																	
(including losses)																	
General Use @ 65.0%	16.7	18.2	18.8	19.4	20.0	20.9	21.9	22.9	24.0	25.2	26.5	27.8	29.1	36.4	44.9	54.5	66.8
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.2	2.7	3.4	4.1	5.0
Identified Existing Industrial @ 65.0%	11.0	11.6	11.9	12.1	12.4	12.8	13.2	13.6	14.1	14.5	15.0	15.5	16.0	18.8	22.1	26.0	30.5
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.0	0.1	1.8	4.5	7.5	10.0	12.4	12.8	13.2	13.6	14.1	14.5	15.0	17.7	20.7	24.4	28.6
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Bulk Sales @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL PEAK LOAD	27.7	29.9	33.8	37.5	41.4	45.3	49.1	51.1	53.2	55.4	57.7	60.0	62.4	75.7	91.3	109.5	131.0
EFFECTIVE LOAD FACTOR																	
	0.651	0.646	0.627	0.611	0.597	0.588	0.581	0.581	0.581	0.582	0.582	0.583	0.583	0.584	0.586	0.587	0.587

Annex 4.14 Energy Sales and Number of Customers

Moshi

Year	Residential Commercial Lt. Industrial 1	Low Voltage Supply 2	High Voltage Supply 3	Public Lighting 4	Zanzibar 5	Total	Total Low & High Voltage 2+3
Energy Consumption (kW.h)							
1980	11,853,263	6,532,223	3,747,303	248,843	-	22,381,432	10,279,526
1981	12,601,267	6,683,057	3,204,468	548,570	-	23,035,362	9,887,525
1982	12,701,287	5,310,587	3,521,838	190,889	-	21,724,601	8,832,425
1983	14,983,000	14,625,000	3,825,000	205,000	-	33,638,000	18,450,000
1984	16,803,866	16,265,705	2,878,149	502,019	-	36,449,739	19,143,854
1985	18,407,762	17,359,243	3,257,012	381,025	-	39,405,042	20,616,255
1986	19,991,319	9,573,507	13,833,115	389,356	-	43,787,297	23,408,622
1987	24,279,220	11,631,978	13,144,419	488,307	-	49,543,924	24,776,397
1988	27,433,007	23,971,295	13,628,187	231,854	-	65,264,343	37,599,482
1989	30,579,668	26,297,692	8,272,972	538,684	-	65,689,016	34,570,664
1990	39,960,942	21,999,918	12,733,576	881,109	-	75,575,545	34,733,494
1991	43,663,071	24,038,071	13,913,261	962,738	-	82,577,142	37,951,333
1992	49,240,835	23,438,071	14,222,319	797,491	-	87,698,716	37,660,390
1993	44,350,352	24,428,368	8,631,637	847,195	-	78,257,552	33,060,005
1994	43,288,316	17,480,753	8,119,496	960,852	-	69,849,417	25,600,249
1995	61,309,769	16,742,946	8,195,900	750,103	-	86,998,718	24,938,846
1996	73,420,938	9,769,725	27,832,242	1,229,149	-	112,252,054	37,601,967
1997	79,022,735	20,103,783	45,394,882	511,400	-	145,032,800	65,498,665
1998	76,834,921	8,953,951	10,169,527	136,194	-	96,094,593	19,123,478
Number of Consumers							
1980	6,377	32	5	-	-	6,414	37
1981	6,366	33	5	-	-	6,404	38
1982	6,894	36	5	-	-	6,935	41
1983	7,437	41	5	-	-	7,483	46
1984	8,805	41	6	111	-	8,963	47
1985	9,659	43	7	129	-	9,838	50
1986	9,592	22	8	158	-	9,780	30
1987	10,754	19	8	190	-	10,971	27
1988	12,725	20	9	218	-	12,972	29
1989	14,396	27	7	245	-	14,675	34
1990	16,269	28	6	263	-	16,566	34
1991	17,856	31	7	274	-	18,168	38
1992	22,271	35	8	799	-	23,113	43
1993	23,987	49	6	303	-	24,345	55
1994	26,011	47	4	352	-	26,414	51
1995	24,024	102	15	15	-	24,156	117
1996	26,215	103	17	23	-	26,358	120
1997	37,881	186	10	105	-	38,182	196
1998	39,825	183	11	109	-	40,128	194
Consumption per Consumer (kW.h)							
1980	1,859	204,132	749,461	-	-	3,489	277,825
1981	1,979	202,517	640,894	-	-	3,597	260,198
1982	1,842	147,518	704,368	-	-	3,133	215,425
1983	2,015	358,707	765,000	-	-	4,495	401,087
1984	1,908	396,725	479,692	4,523	-	4,067	407,316
1985	1,906	403,703	465,287	2,954	-	4,005	412,325
1986	2,084	435,159	1,729,139	2,464	-	4,477	780,221
1987	2,258	612,209	1,643,052	2,570	-	4,516	917,644
1988	2,156	1,198,565	1,514,243	1,064	-	5,031	1,296,534
1989	2,124	973,989	1,181,853	2,199	-	4,476	1,016,784
1990	2,456	785,711	2,122,263	3,350	-	4,562	1,021,573
1991	2,445	775,422	1,987,609	3,514	-	4,545	998,719
1992	2,211	669,659	1,777,790	998	-	3,794	875,823
1993	1,849	498,538	1,438,606	2,796	-	3,215	601,091
1994	1,664	371,931	2,029,874	2,730	-	2,644	501,966
1995	2,552	164,147	546,393	50,007	-	3,602	213,153
1996	2,801	94,852	1,637,191	53,441	-	4,259	313,350
1997	2,086	108,085	4,539,488	4,870	-	3,798	334,177
1998	1,929	48,929	924,502	1,249	-	2,395	98,575

* - Effective March 1986 Heavy Industrial & Large Commercial are billed by Voltage Level.

** - Effective March 1995 Tariffs 1, 2 & 3 are combined as T1; Tariff 4, 4A & 8 as T2; Tariff 5 & 5A as T3, Tariff 6 as T4 and Tariff 9 as T5.

Annex 4.15
Moshi (MW.h)

Reference Case	Actual 1998	[Reduced Industrial List]															
		1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt Indust	76,835	87,028	96,800	107,587	119,398	132,395	148,089	160,810	173,718	184,882	196,510	208,623	221,241	232,574	380,318	487,890	619,965
Identified Rural Electrification	0	0	4,254	4,727	5,247	5,818	6,446	7,067	7,634	8,125	8,636	9,168	9,723	12,862	16,714	21,441	27,245
TOTAL GENERAL USE (MWh)	76,835	87,028	101,054	112,314	124,645	138,213	154,535	167,877	181,352	193,008	205,146	217,791	230,964	305,536	397,032	509,331	647,210
Annual Growth Rate		13.3%	19.1%	11.1%	11.0%	10.2%	10.8%	8.6%	8.0%	6.4%	6.3%	6.2%	6.0%	5.8%	6.4%	5.1%	4.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	19,123	19,843	20,740	21,673	22,645	23,658	24,713	25,812	26,956	28,148	29,390	30,683	32,030	33,858	49,018	60,502	74,604
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	0	1,380	1,380	2,300	5,488	6,473	8,760	7,090	7,372	7,697	8,036	8,389	10,387	12,838	15,846	19,540
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	19,123	19,843	22,119	23,053	24,945	29,147	31,186	32,572	34,016	35,520	37,087	38,719	40,419	50,044	61,654	76,348	94,144
Annual Growth Rate		3.8%	11.6%	4.2%	8.2%	16.8%	7.0%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.3%	4.3%	4.3%
PUBLIC LIGHTING																	
	138	159	182	204	227	250	272	295	318	341	363	385	407	533	688	879	1,112
Annual Growth Rate		16.7%	14.3%	12.5%	11.1%	10.0%	9.1%	8.3%	7.7%	7.1%	6.7%	6.5%	6.3%	6.8%	6.2%	5.0%	4.8%
BULK SALES																	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Growth Rate																	
TOTAL CONSUMPTION																	
	96,095	107,030	123,355	135,551	149,817	167,609	184,572	200,744	215,686	228,867	242,597	256,895	271,790	356,114	459,574	586,557	742,455
Annual Growth Rate		11.4%	15.3%	9.9%	10.5%	11.9%	10.1%	8.8%	7.4%	6.1%	6.0%	5.9%	5.8%	5.6%	5.2%	5.0%	4.8%
LOSSES																	
Technical Losses*	-	10,741	11,515	11,726	11,958	13,378	14,732	16,023	17,218	18,268	19,363	20,505	21,694	23,424	36,682	46,518	59,262
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	8,593	9,068	9,068	9,054	10,129	11,154	12,132	13,035	13,831	14,601	15,525	16,425	21,521	27,774	35,448	44,870
Loss Rate (%)	-	6.8%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	14,374	19,334	20,583	20,784	21,012	23,507	25,886	28,154	30,253	32,099	34,024	36,030	38,119	49,945	64,456	82,265	104,131
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
	110,469	126,364	143,938	156,345	170,829	191,117	210,459	228,898	245,938	260,985	276,621	292,925	309,909	406,059	524,029	668,822	846,597
Annual Growth Rate		14.4%	13.9%	8.0%	8.3%	11.9%	10.1%	8.8%	7.4%	6.1%	6.0%	5.9%	5.8%	5.6%	5.2%	5.0%	4.8%
CONTRIBUTION TO SYSTEM PEAK (MW) (Including losses)																	
General Use @ 65.0%	15.5	18.0	19.8	21.8	23.9	26.5	29.4	32.2	34.8	37.0	39.4	41.8	44.3	56.6	76.2	97.7	124.2
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.6	1.7	1.9	2.1	2.3	2.5	2.6	2.8	3.0	3.2	4.2	5.4	7.0	8.9
Identified Existing Industrial @ 65.0%	3.9	4.1	4.3	4.4	4.5	4.7	4.9	5.2	5.4	5.6	5.9	6.1	6.4	7.9	9.8	12.1	14.9
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.0	0.0	0.4	0.4	0.7	1.6	1.9	2.0	2.0	2.1	2.2	2.3	2.4	3.0	3.7	4.8	5.7
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Bulk Sales @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL PEAKLOAD	19.4	22.2	26.0	28.2	30.9	34.8	38.3	41.7	44.8	47.5	50.3	53.3	56.4	73.9	95.3	121.6	153.8
EFFECTIVE LOAD FACTOR																	
	0.651	0.650	0.633	0.633	0.632	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.627	0.628	0.628	0.628	0.628

Annex 4.16
Moshi (MW.h)

	Actual 1998	[Full Industrial List]															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm & Lt. Indust	76,835	86,987	97,743	108,767	123,208	138,230	155,017	172,250	188,488	203,115	218,499	234,879	251,696	350,951	478,718	643,211	855,012
Identified Rural Electrification	0	0	4,264	4,777	6,362	8,018	8,747	7,487	8,203	8,840	9,510	10,214	10,854	15,274	20,835	27,994	37,212
TOTAL GENERAL USE (MWh)	76,835	86,987	101,997	114,545	128,570	144,248	161,763	179,747	196,692	211,955	228,008	244,893	262,551	366,225	499,553	671,205	892,224
Annual Growth Rate		13.2%	17.3%	12.3%	12.2%	12.2%	12.1%	11.1%	9.4%	7.8%	7.6%	7.4%	7.3%	6.9%	6.4%	6.1%	5.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	19,123	19,843	20,969	22,163	23,398	24,708	26,085	27,534	29,057	30,660	32,345	34,118	35,982	46,856	60,854	78,875	102,079
Miscellaneous Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Industrial Loads - Full Growth	0	0	1,380	1,380	2,300	5,504	6,505	6,866	7,246	7,646	8,066	8,508	8,973	11,685	15,176	19,670	25,456
New Industrial Loads - Low Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL INDUSTRIAL (MWh)	19,123	19,843	22,349	23,533	25,698	30,212	32,590	34,400	36,304	38,306	40,411	42,626	44,956	58,541	76,029	98,544	127,535
Annual Growth Rate		3.8%	12.6%	5.3%	9.2%	17.6%	7.9%	5.8%	6.0%	5.5%	5.6%	5.5%	5.5%	5.4%	5.4%	5.3%	5.3%
PUBLIC LIGHTING																	
	136	163	189	216	243	269	296	323	349	376	403	431	461	637	863	1,155	1,530
Annual Growth Rate		19.6%	18.4%	14.1%	12.3%	11.0%	9.3%	9.0%	8.3%	7.8%	7.1%	7.1%	7.0%	6.7%	6.3%	6.0%	5.8%
BULK SALES																	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Growth Rate																	
TOTAL CONSUMPTION																	
	96,095	106,993	124,635	138,293	154,511	174,727	194,649	214,470	233,345	250,637	268,822	287,950	308,067	425,403	578,446	770,904	1,021,288
Annual Growth Rate		11.3%	16.4%	11.0%	11.7%	13.1%	11.4%	10.2%	8.6%	7.4%	7.3%	7.1%	7.0%	6.7%	6.3%	6.0%	5.8%
LOSSES																	
Technical Losses*	-	10,737	11,625	11,963	12,333	13,948	15,538	17,118	18,825	20,005	21,457	22,983	24,589	33,955	46,011	61,532	81,517
Loss Rate (%)	-	8.5%	8.0%	7.5%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Non-Technical Losses*	-	3,590	9,155	9,251	9,335	10,559	11,763	12,961	14,102	15,147	16,246	17,402	18,618	25,709	34,837	46,588	61,720
Loss Rate (%)	-	6.8%	6.3%	5.8%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
TOTAL LOSSES	14,374	19,327	20,780	21,215	21,670	24,506	27,300	30,080	32,727	35,152	37,703	40,385	43,207	59,663	80,847	108,120	143,237
Total Loss Rate (%)	13.0%	15.3%	14.3%	13.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%	12.3%
REQUIRED TOTAL GENERATION																	
	110,468	126,320	145,315	159,508	176,181	199,233	221,949	244,549	268,072	285,789	306,525	328,335	351,274	485,066	657,293	879,024	1,164,525
Annual Growth Rate		14.3%	15.0%	9.8%	10.5%	13.1%	11.4%	10.2%	8.6%	7.4%	7.3%	7.1%	7.0%	6.7%	6.3%	6.0%	5.8%
CONTRIBUTION TO SYSTEM PEAK (MW)																	
(Including losses)																	
General Use @ 65.0%	15.5	18.0	20.0	22.2	24.7	27.7	31.0	34.5	37.7	40.7	43.8	47.0	50.4	70.3	95.9	128.8	171.2
Rural Electrification @ 40.0%	0.0	0.0	1.4	1.6	1.7	2.0	2.2	2.4	2.7	2.9	3.1	3.3	3.6	5.0	6.8	9.1	12.1
Identified Existing Industrial @ 65.0%	3.9	4.1	4.3	4.5	4.7	4.9	5.2	5.5	5.8	6.1	6.5	6.8	7.2	9.4	12.2	15.8	20.4
Miscellaneous Industrial @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Industrial Loads - Full Growth	0.0	0.0	0.4	0.4	0.7	1.6	1.9	2.0	2.1	2.2	2.3	2.5	2.6	3.4	4.4	5.7	7.4
New Industrial Loads - Low Growth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Lighting @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3
Bulk Sales @ 65.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL PEAK LOAD	19.4	22.2	26.2	28.7	31.8	36.2	40.4	44.5	48.4	52.0	55.7	59.7	63.9	88.1	119.4	159.6	211.4
EFFECTIVE LOAD FACTOR																	
	0.651	0.650	0.633	0.633	0.632	0.628	0.627	0.627	0.628	0.628	0.628	0.628	0.628	0.628	0.628	0.629	0.629