

AFRICAN DEVELOPMENT FUND



PROJECT COMPLETION REPORT

ELECTRICITY IV PROJECT

UNITED REPUBLIC OF TANZANIA

INFRASTRUCTURE DEPARTMENT

**OINF
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EQUIVALENTS AND ABBREVIATIONS

CURRENCY EQUIVALENTS

			<u>PCR</u>	<u>Appraisal</u>
1 UA	=	TSH	1945.48	303.700
1 UA	=	US \$	1.5044	1.31452
US \$	=	TSH	1293.2	231.034

WEIGHTS AND MEASURES

1.00 meter (m)	=	3.281 ft.
1.00 kilometre (km)	=	0.621 mile
1.00 square kilometre (km ²)	=	0.386 square mile (mi ²)
1.00 hectare (ha)	=	2.471 acres
1.00 kilogram (kg)	=	2.205 lbs.

FISCAL YEAR

At PCR	1 st January to 31 st December
At Appraisal	1 st July to 30 th June

ABBREVIATIONS

ADB	=	African Development Bank
ADF	=	African Development Fund
APA	=	Advance Procurement Action
CAA	=	Civil Aviation Authority
DANIDA	=	Danish International Development Agency
DCF	=	Discounted Cash flow
EA	=	Executing Agency
EHV	=	Extra High Voltage
EIA	=	Environmental Impact Assessment
EIB	=	European Investment Bank
EIRR	=	Economic Internal Rate of Return
EWURA	=	Electricity and Water Utilities Regulatory Authority
FE	=	Foreign Exchange
FIRR	=	Financial Internal Rate of Return
GOT	=	Government of United Republic of Tanzania
IDA	=	International Development Association
ICB	=	International Competitive Bidding
IPP	=	Independent Power Producer
LC	=	Local Cost
MEM	=	Ministry of Energy and Minerals
NORAD	=	Norwegian Agency for Development Cooperation
NPV	=	Net Present Value
NTF	=	Nigerian Trust Fund
NDF	=	Nordic Development Fund
OGL	=	Open General Licence
PCR	=	Project Completion Report
PIU	=	Project Implementation Unit
PLCC	=	Power Line Carrier Communication
RE	=	Resident Engineer
RFP	=	Request for Proposals
TAF	=	Technical Assistance Fund
TANESCO	=	Tanzania Electric Supply Company Limited
TOR	=	Terms of Reference
UA	=	Unit of Account

TANZANIA

ELECTRICITY IV PROJECT - PROJECT COMPLETION REPORT: PROJECT MATRIX

Design Team: S. Arungu-Olende & A. Akintunde

Narrative Summary	Verifiable Indicators		Means of Verification	Assumptions/ Risks
	Appraisal (1991)	PCR (2006)		
<p>Sector Goal</p> <p>1.1 To electrify the remaining un-electrified districts in the country by 2005.</p>	1.1 74% of the Districts will be electrified by 2000.	1.1 74.95% of the Districts have been electrified by 2004	1.1 Ministry of Energy/TANESCO statistics.	<p>(Goal to Super goal)</p> <p>The additional supply of power will increase the level of economic activity (thereby alleviating poverty and improving quality of life) and reduce the consumption of fuel wood in the project area.</p>
<p>Project Objectives</p> <p>2.1 To strengthen high voltage grid of Tanzania by extending the North West Network, connecting the existing Singida and Arusha sub-stations with a 220 kV single circuit line to mitigate the acute voltage problem of low voltages, unreliable power supply and severe load shedding in Arusha and Kilimanjaro regions.</p> <p>2.2 To meet the suppressed and fast growing demand by providing materials for rehabilitation and extension of Medium Voltage distribution system, hampered so far by TANESCO's foreign exchange constraints.</p> <p>2.3 To develop new rural electrification networks in Moshi and Arusha regions to provide electricity to 7 new rural centres and 2 district headquarters.</p>	<p>2.1 Improvement in reliability, availability and efficiency of the network.</p> <p>2.2 Enhancement of population's access to electricity.</p>	<p>2.1 The North West Network has been connected, resulting in improved reliability; problems of low voltages and unreliable power supply have been substantially mitigated and load shedding eliminated</p> <p>2.2 Rehabilitation has been successfully completed; supplies to industrial, tourism and agro business have been increased and a large part of the growing demand met.</p> <p>2.3 Increased access to electricity in rural areas.15 townships and 30 villages have been connected. 137,668 new customers nationwide with the project accounting for about 25%</p>	<p>2.1 TANESCO statistical reports and bulletins, study reports.</p> <p>2.2 TANESCO statistical reports. Borrower's PCR</p> <p>2.3 TANESCO statistical reports.</p>	<p>(Project Objective to Goal)</p> <p>2.1Co-financing is tied up to DANIDA and NDF financed components.</p>
<p>Outputs*</p> <p>3.1 Construction of 220kV transmission line Singida-Babati-Arusha;</p> <p>3.2 Upgrading of 220kV substation at Singida and construction of 220kV substation at Arusha;</p> <p>3.3 Construction of 220/66/ 33/11 kV substation at Babati, construction of 66/33/11 kV substation at Kondoa, construction of 66/33 kV substations at Mbulu and Karatu.</p> <p>3.4 Construction of 66 kV, 33kV and 11kV and LV distribution lines; supply of services lines and meters;</p> <p>3.5 Construction of distribution substation;</p> <p>3.6 Rehabilitation of Moshi and Arusha distribution;</p> <p>3.7 Supply of tools and equipment;</p> <p>3.8 Supply of vehicles;</p>	<p>3.1 316km of Singida-Babati-Arusha line.</p> <p>3.2 Upgraded substation at Singida and newly commissioned substation at Arusha;</p> <p>3.3 The commissioned substation at Babati, Kondoa, Mbulu and Karatu.</p> <p>3.4 507 km of medium and low voltage power lines; The supply of 32,600 service lines and meters (30,800 single phase and 1800 three phase)</p> <p>3.5 57 distribution substations.</p> <p>3.6 Completion of system Rehabilitation at Moshi and Arusha.</p> <p>3.7 Completion of supply of tools and equipment.</p> <p>3.8 Completion of supply of four – 4 WD station wagons, four – 4 WD double cabin</p>	<p>3.1. 316km of Singida-Babati-Arusha line installed</p> <p>3.2 . Substation at Singida upgraded Substation at Arusha commissioned</p> <p>3.3 Substation at Babati, Kondoa, Mbulu and Karatu commissioned.</p> <p>3.4. Completed: 507 km of medium and low voltage power lines; the supply of 32,600 service lines and meters (30,800 single phase and 1800 three phase)</p> <p>3.5: Installed: 57 distribution substations</p> <p>3.6. System Rehabilitated at Moshi and Arusha.</p> <p>3.7 Supplied: tools and equipment.</p> <p>3.8 Supplied: four – 4 WD station</p>	<p>.1 TANESCO Quarterly Progress Reports</p> <p>.2 TANESCO's PCR at completion of works.</p> <p>.3 Supervision Mission's Reports.</p> <p>(Applicable to Phases I and II)</p>	<p>(Output to Project Objective)</p> <p>1 Adequate inflow of internally generated cash from TANESCO to finance the local cost component of the project.</p> <p>2 Electricity tariff will be rationalized to reflect the cost of supply.</p> <p>3 Effectiveness of billing and collection.</p> <p>4 Coordination of co-financiers.</p> <p>5 Performance of PIU and Consultant.</p> <p>6 Performance of Contractors.</p> <p>(Applicable to Phases I and II)</p>

<p>3.9 Training of staff; 3.10 Engineering design and supervision.</p>	<p>pick ups, three – 2 WD 7-8 tonne trucks and one – 2 WD 8-9 tonne truck with a crane. 3.9 Completion of staff Training. 3.10 Recruitment of Consultant.</p>	<p>wagons, four – 4 WD double cabin pick ups, three – 2 WD 7-8 tonne trucks and one – 2 WD 8-9 tonne truck with a crane 3.9: Partial implementation of staff Training. 3.10 Consultant Recruited. Phase II completed for i) construction of 300 km of 33 kV lines; ii) construction of 49 km of low voltage lines; iii) construction and installation of 52 distribution transformers; iv) construction and installation of 600 service lines and meters; v) installation of 75 street lights; vi) supply of tools and equipment; and vii) engineering and project management.</p>		
<p>Activities* 4.1 Procurement of equipment for EHV substations and construction. 4.2 Procurement of materials and equipment for 66, 33, 11 kV lines and construction. 4.3 Procurement of distribution transformers, service lines, meters and installation. 4.4 Procurement of vehicles, testing and maintenance, and safety equipment. 4.5 Procurement of materials and equipment for rehabilitation works for Arusha and Moshi. 4.6 Procurement of Consultancy services.</p>	<p>Inputs/Resources 4.1 Estimated cost of project is UA 81.657 million with scheme of financing as hereunder Resources (UA million) ADF 23.026 NTF 5.999 NDF 3.987 DANIDA 42.187 GOT 6.454 Total 81.653 EIRR (%) = 14 FIRR (%) = -2.11</p>	<p>Inputs/Resources Actual costs (UA million) 71.551 Resources (UA million) ADF 21.011 NTF 4.504 DANIDA 38.708 NDF 3.987 GOT 3.341 Total 71.551 EIRR (%) = 6.39 FIRR (%) = 4.09</p>	<p>4.1 Approval of bidding document, bid evaluation reports. 4.2 Submission of Reports 4.3 Disbursement of funds. 4.4 Audit of Accounts</p>	<p>Activity to output 4.1 The PIU and Consultant are mobilized at site to proceed with project implementation. 4.2 Implementation of project follows the implementation schedule. 4.3 Adherence to loan and procurement conditions.</p>

BASIC PROJECT DATA*

* Some of the information required in the PBD could not be availed because of some project files were left behind during Bank relocation from Abidjan.
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1. Country : Tanzania
2. Project : Electricity IV
3. Loan Number : ADF 21001500000997
NTF 2200160000056
4. Borrower : Government of Tanzania
5. Beneficiary : Tanzania Electric Supply Company Limited (TANESCO)
6. Executing Agency : Ministry of Energy and Minerals

A. LOAN DETAILS

Description	At Appraisal	Actual
ADF Loan (UA million)	23.026	21.011
2. Service Charge	0.75% per annum on the amount disbursed and outstanding.	
3. Repayment Period	40 years	
4. Grace Period	10 years	
5. Repayment	1% of the principal each year from the eleventh to twentieth year inclusive and 3% each year thereafter.	
NTF Loan (UA million)	6.000	4.504
2. Commitment Fees	0.75% per annum on the undisbursed balance commencing 120 days after the signing of the loan agreement	
3. Interest	4 % per annum on amounts disbursed and outstanding.	
4. Repayment Period	25 years	
5. Grace Period	5 years	
6. Repayment	Over 20 years after the expiration of the grace period, in 40 consecutive and semi-annual instalments.	
7. Loan Negotiation Date	?	
8. Loan Approval Date	16 December 1991	
9. Loan Signature Date	1 December 1992	
10. Date of Entry into Force	17 August 1994	

B. PROJECT DATA

1. Project Costs (in UA million)

Item of Cost	Appraisal	Actual
Foreign Exchange Component	68.962	64.115
Local Cost Component	12.694	7.436
Total Cost	81.656	71.551

2. Source of Finance (in UA million)

Source	Appraisal				Actual			
	FE	LC	Total	%	FE	LC	Total	%
ADF	23.026	0	23.026	28.20	21.011	0	21.011	29.37
NTF	6	0	6	7.35	4.504	0	4.504	6.29
DANIDA	35.949	6.239	42.188	51.67	34.613	4.095	38.708	54.10
NDF	3.987	0	3.987	4.88	3.987		3.987	5.57
GOT	0	6.455	6.455	7.91	0	3.341	3.341	4.67
Total	68.962	12.694	81.656	100.00	64.115	7.436	71.551	100.00

		<u>Appraisal</u>	<u>Actual</u>
3.	Effective Date of First Disbursement: ADF	04/92	13/05/96
	NTF	04/92	03/03/95
4.	Effective Date of Last Disbursement: ADF	31/12/95 ?	12/05/2005
	NTF	31/12/95 ?	01/04/2005
5.	Commencement of Project:	01/01/92 ?	01/1998
6.	Completion of Project	01/01/92?	31/12/2004

C. PERFORMANCE INDICATORS

1.	Cost Under-run	-	Project	:	12.38%
		-	ADB Component	:	18.67%
2.	Time Overrun (including additional works)				
*	Slippage on Effectiveness (%)			:	166.67%
*	Slippage on Completion Date		Phase I	:	27.08%
			Phase II	:	44.83%
*	Slippage on Last Disbursement		Phase I	:	48 months
			Phase II	:	13 months
*	Number of Extensions of Loan Validity Period		Phase I	:	2 ???
			Phase II	:	1
3.	Project Implementation Status			:	Completed
4.	List of Verifiable Indicators and Levels of Achievement				

Evaluation Criterion	Score	
	Maximum	Actual
1. Time Overruns	4	2
2. Cost Under Run	4	4
3. Adherence to Contractual Conditions	4	3
4. Adequacy of Supervision and Reports	4	3
5. Operational Performance	4	3
Total Score	20	15

5.	Implementation Performance		
*	Institutional Performance	:	Satisfactory
*	Consultant's Performance	:	Satisfactory
*	Contractor's Performance	:	Satisfactory

6. Economic Internal Rate of Return (EIRR):

Appraisal : 14 %
Actual : 6.39%

7. Financial Internal Rate of Return (FIRR):

Appraisal : -2.11%
Actual : 4.09%

D. MISSIONS

Project Cycle	D/M/Y	No. of Persons	Composition	Man Days
1. Identification	-	-	-	-
2. Preparation	9/1991-	-	-	-
3. Appraisal	9/1991			
4. Supervision/ follow up	3/1998	2	Power Eng & Fin Analyst	16
	4/1999	2	Power Eng & Fin. Analyst	8
	8/1999	2	Power Eng & Fin. Analyst	15
	3/2000	2	Power Eng & Fin. Analyst	17
	11/2001	1	Power Eng	7
	5/2002	1	Power Eng.	7
	12/2003	1	Power Eng	7
	11/2004	1	Power Eng	7
	2/2005	1	Power Eng	7
5. PCR	12/2006 - 1/2007	2	Power Engineer & Financial Analyst	21

E. BANK LOAN –DISBURSEMENTS (UA MILLION)

Year	ADF				NTF			
	As at Appraisal		Actual		As at Appraisal		Actual	
	Amount	Cum.(%)	Amount	Cum.(%)	Amount	Cum.(%)	Amount	Com.(%)
1992					1.236	20.60		
1993	4.941	21.46			0.903	15.05		
1994	9.106	39.55			1.67	27.83		
1995	7.712	33.49			-	1.639	0.260	5.77
1996	1.267	5.50	0.112	0.53	0.552	9.20	0.076	1.69
1997			0.102	0.49				-
1998			7.289	34.69			0.662	14.70
1999			8.034	38.24			1.532	34.01
2000			4.103	19.53			1.033	22.94
2001			0.369	1.76			0.124	2.75
2002							0.210	4.66
2003							0.302	6.71
2004			0.667	3.17			0.284	6.31
2005			0.335	1.59			0.021	0.47
	23.026	100	21.011	100	6.000	100	4.504	100

(Disbursements for Phases I and II)

F. CONTRACTORSPhase IContractor Package (i)

Name	Pauwels International NV, Belgium
Contract Description	Procurement of power transformers, reactors and distribution transformers (components iii) & v)
Date Works Commenced	March 1998
Date Contract Completed	October 1998
Contract Duration	6 months
Amount	88,477,000 BEF ; training 112,000 BEF

Contractor Package (ii)

Name	ABB Transmit Oy of Finland
Contract Description	Construction of substation (component iii)
Date Works Commenced	July 1998
Date Contract Completed	December 1999
Contract Duration	14 months
Amount	\$12,654,827 and TSh53,841,150

Contractor Package (iii)

Name	Kolon International Corporation, South Korea
Contract Description	Procurement and construction of conductors, insulators and accessories (component iv)
Date Works Commenced	March 1998
Date Contract Completed	December 1999, but there were delays in delivering some parts
Contract Duration	+ 21 months
Amount	\$ 2,988,990. and \$94,261?

Contractor Package (iv)

Name	ABB SAE S.P.A/ICIL of respectively Italy & United Kingdom
Contract Description	Acquisition and construction of line material (component iv).
Date Works Commenced	March 1998
Date Contract Completed	March 2000
Contract Duration	24 months
Amount	\$ 6,991,939 and Tsh 508,741,082

Contractor Package (iv)

Name	Kolon International Corporation, South Korea
Contract Description	Acquisition and construction of line material (component iv).
Date Works Commenced	March 1998
Date Contract Completed	January 2000
Contract Duration	22 months
Amount	\$4,982,314 and Tsh 103,436,904

Contractor

Name	John Achelis & Shone of Germany
Contract Description	Supply of tools and equipment (component 7)
Date Works Commenced	August 1999?
Date Contract Completed	December 1999
Contract Duration	3 months
Amount	DEM 310,578.80 UA 146,481.15

Contractor

Name	International Motors (Toyota)
Contract Description	Supply of lot1 vehicles (four 4-WD station wagons)
Date Works Commenced	1999?
Date Contract Completed	2000
Contract Duration	3 months
Amount	Y13,240,868 UA 80,991.83

Contractor

Name	Tradex
Contract Description	Supply of lot 2 vehicles (four 4WD Double Cabin Pick-ups four 4-WD single cabin pick –ups, three 2WD 7-8 tonnes trucks and one 2WD 8-9 tonne truck with a crane)
Date Works Commenced	1999?
Date Contract Completed	2000?
Contract Duration	3 months
Amount	Y 35,996,150 UA 220,181

G. Consultant

Name	TECSULT
Contract Description	preparation of technical specifications, tender documents; negotiation and administration of contracts; evaluation of bids; detailed engineering and project supervision; preparation of periodic progress reports
Date Works Commenced	August?,1994
Date Contract Completed	March, 2000
Contract Duration	78 months?
Amount	UA 1,540,681?

Phase II

Name	M/S Daewoo Int. Corp. South – Korean
Contract Description	Procurement of distribution transformers
Date Works Commenced	February 2002?
Date Contract Completed	May 2005
Contract Duration	39 months?
Amount	157,925.00 USD and 7,898,000 TSH

Name	M/S Daewoo Int. Corp. South – Korean
Contract Description	Procurement of line materials
Date Works Commenced	May 2002?
Date Contract Completed	May 2005?
Contract Duration	36 months?
Amount	1,488,424.00 USD and 573,993,196 TSH

Consultant

Name	TECSULT
Contract Description	Preparation of technical specifications, tender documents; negotiation and administration of contracts; evaluation of bids; detailed engineering and project supervision; preparation of periodic progress reports.
Date Works Commenced	June 2002
Date Contract Completed	June 2005
Contract Duration	36 months
Amount	\$Can1,082,536?

EXECUTIVE SUMMARY

1. INTRODUCTION

1.1 Tanzania is situated on the coast of East Africa and covers an area of 947,000 square kilometres. It is endowed with a large potential for hydro electric power but the main generating stations are located in the central and southern parts of the country, away from most urban centres.

1.2 In the 1980s the demand for electricity in Tanzania was growing fast. It thus became imperative to expand the national high voltage grid to facilitate the transmission of the relatively cheaper hydro-electricity. A study commissioned by TANESCO in 1985 concluded that the Arusha and Kilimanjaro regions would need to be connected to the 220 kV network by 1995. Subsequently, the Company contracted a consultant to study the possibility of connecting Singida 220 kV substation to Arusha substation.

1.3 In August 1990, the Government of Tanzania requested the Bank Group to consider financing the foreign exchange costs of the project. A preparatory mission visited the country on December 1990, followed on September 1991 by Project Appraisal Mission, after confirmation by the Bank of co-financing.

1.4 This Project Completion Report (PCR) is based on the appraisal report, project files in the Bank, Borrower's quarterly progress reports and PCR, interviews and site inspection conducted during an ADB mission to Tanzania on December 2006.

Project objective and formulation

1.5 The objectives are to: (i) strengthen high voltage grid of Tanzania by extending the North West Network, connecting the existing Singida and Arusha sub-stations with a 220 kV single circuit line to mitigate the acute problem of low voltages, unreliable power supply and severe load shedding in Arusha and Kilimanjaro regions; (ii) meet the suppressed and fast growing demand by providing materials for rehabilitation and extension of Medium Voltage Distribution System, hampered so far by TANESCO'S foreign exchange constraints; and (iii) develop new rural electrification networks in Arusha and Kilimanjaro regions to provide electricity to seven new rural centres and two district headquarters.

1.6 The main components of the project were: (i) construction of 220kV transmission line Singida-Babati-Arusha; (ii) up-grading of 220kV substation at Singida and construction of 220kV substation at Arusha; (iii) construction of 220/66/33/11 kV substation at Babati, construction of 66/33/11 kV substation at Kondoa, construction of 66/33 kV substations at Mbulu and Karatu; (iv) construction of 66 kV, 33kV and 11kV and LV distribution lines & supply of services lines with meters; (v) construction of distribution substations; (vi) rehabilitation of Moshi and Arusha distribution networks; (vii) supply of tools and equipment; (viii) supply of vehicles; (ix) training of staff; and (x) engineering, design and supervision..

1.7 Savings in project implementation were used for further extension of the grid to rural areas and became Phase II of the project. The components for Phase II of the project comprised: (i) construction of 300 km of 33 kV lines; (ii) construction of 49 km of low voltage lines; (iii) construction and installation of 52 distribution transformers; (iv) construction and installation of 600 service lines with meters; (v) installation of 75 street lights; and (vi) engineering, design, supervision and project management.

1.8 The project was financed by the African Development Fund (ADF), the Nigerian Trust Fund (NTF), the Nordic Development Fund (NDF) and the Danish International Development Agency (DANIDA). The Government of Tanzania financed part of the local costs. The ADF loan of UA 23.026 million and NTF loan of UA 6.00 million were approved on 1st December 1991.

Project Execution and Implementation Schedule

1.9 The Project was executed by the Tanzania Electric Supply Company Limited (TANESCO), through a Project Implementation Unit (PIU), established for the purpose; and was headed by the TANESCO Rural Electrification Manager as a Project Manager, assisted by a Consultant, TECSULT, of Canada.

1.10 There were delays in project execution - in loan effectiveness and during implementation i.e. after starting the project. Nevertheless, the project was generally satisfactorily executed.

Project Costs and Financial Resources

1.11 At appraisal in 1991, the estimated overall cost (net of all taxes) of the project was UA 81.70 million of which the foreign exchange cost was UA 70 million or 84.45 % of the total and the local cost was UA 12.7 million or 15.55 % of the total. The actual overall cost at completion was UA 71.56 million of which the foreign exchange cost was UA 64.1million or 89.61 % of the total and the local cost was UA 7.44 million or 10.39 % of the total.

Overall Assessment

1.12 The project was satisfactorily executed and its objectives met. The Executing Agency (EA) and Borrower in consultation with the Bank provided appropriate responses and solutions to the problems arising in the course of implementation. Coordination and efforts of all parties involved was in general effective. There were savings which were used to finance Phase II of the project.

Economic Performance

1.13 The calculated economic internal rate of return (EIRR) at PCR is 6.39% compared to appraisal figure of 14%. This EIRR is lower than the opportunity cost of capital of 11% in Tanzania.

Financial Performance

1.14 The retrospective financial internal rate of return at PCR is 4.09% compared to (-) 2.11% at appraisal.

2. CONCLUSIONS, LESSONS LEARNT AND RECOMMENDATIONS

Conclusions

2.1.1 The project objectives have been met. The project was well formulated and attracted co-financing by the Bank Group as well as DANIDA and NDF. However, there was a delay of 32 months in starting the project. Economic and social situations have improved since appraisal, resulting in rapid growth in electricity demand, prompting expansion of the electricity system. However, the expansion of the distribution system in the country has not kept pace with the rapid growth in demand.

2.1.2 Although GOT has initiated actions to reform the energy sector the privatisation of TANESCO has been suspended; the management and financial positions of TANESCO are still weak.

2.1.3 The current tariff structure in the country is inadequate. TANESCO is still unable to recover its operating expenses, and the Government has had to subsidize the company. The requirements for investment in the electricity sector in Tanzania are large and growing, requiring the Government to create an enabling environment for private sector investment.

2.1.4 Both technical and non-technical distribution system losses in the project areas and in the entire country are high and will negatively impact on project sustainability. So will the examples of poor maintenance and system operation in the project areas.(this sentence is incomplete!!!!!!)

2.2 Lessons Learnt

2.2.1 The lessons learnt from this project are given hereunder.

- Closer co-ordination and synchronisation by the Bank of activities with those of other donors would have reduced the delay in loan effectiveness that occurred on this project. (para. 3.3.2)
- Delays during implementation would have been reduced had the Borrower been better appraised of the Bank's procurement rules and procedures. (para.3.3.3);
- The Bank ought to have ensured that the observed lapses in the audit reports were rectified. (para. 3.4.3);
- More rigorous examination of loan conditions and, where necessary, provision of technical assistance, would ensure appropriateness of the conditions.(para 4.7.2);
- An earlier study and appreciation of the liberalisation process by the Borrower would have minimised the negative impact on TANESCO. (para. 4.3.2 & 4.3.4);
- A baseline study on socio-economic profile of the project areas would have provided a bench mark for evaluating the effectiveness of the project after completion. (para.4.8.3);

2.3 Recommendations

2.3.1 It is recommended as follows:

For the Borrower

- The Government effort to develop rural electrification should be done within the framework of national electricity development strategy, which in turn must be part of the overall national energy policy and strategy; (Para 1.3)
- The conclusions and recommendations of many studies undertaken in the past should be updated, coordinated and harmonised to chart the direction for the country's energy/electricity policy; (Para. 1.3)
- The Government should create an enabling environment for private sector investment to help meet the fast growing requirements for electricity in the country; (para. 6.5)
- Time bound plans should be put in place to reduce the technical and non-technical losses as a matter of urgency; (Para 6.7)
- GOT should study the cost effectiveness of IPPs and their impact on tariffs; (para 4.3.6.)
- Tariff studies done in the past should be updated on a comprehensive basis to provide a rationale for any future increases. (para 4.3.6)
- GOT should further reform and restructure TANESCO to enhance its management capability and improve its weak financial situation; (para 4.9.3 & 6.3)
- Effective operation and maintenance approaches should be nurtured and implemented in order to ensure sustainability of the power system; (para 6.8)
- In the future, GOT should undertake baseline study on project areas to provide a bench mark for evaluating the effectiveness after completion; (para.4.8.3)

For the Bank

- The Bank should ensure that audit reports submitted by Borrowers are forwarded to the office of the Auditor General for review and comments, which should promptly be conveyed to the Borrower. (para. 3.4.3 and 4.3.7)
- The reform of public utilities and accounts receivable in African countries should be studied with a view to finding approaches best suited to the conditions in these countries. (para 4.3.4 & 4.3.10)
- The Bank and other donors should play a more central role in boosting investment to meet the growing requirements in the electricity sub-sector (para. 6.5)

1. INTRODUCTION

1.1 Tanzania is situated on the coast of East Africa and covers an area of 947,000 square kilometres. The bulk of the population lives in the rural areas with limited access to electricity.

1.2 The country is endowed with a large potential for hydro electric power, located in the central and southern parts of the country, away from most urban centres. Between the years 2003 and 2006 the country went through a power supply crisis as a result of persistent drought. This led to poor power quality nationwide, occasioned by frequent power outages and load shedding, all of which have adversely affected economic and industrial development. The Government initiated emergency procedures to improve the situation; and is also examining strategies for the diversification to mitigate against the impact of future droughts.

1.3 A number of studies have been commissioned aimed at achieving the broader objectives of developing a national power system. These include the Tanzania Rural Electrification Study (2005) funded by the Bank; and the Power System Master Plan Update 2003. Furthermore, an electricity strategy document for implementing broad policy concerns in the electricity sub-sector has been prepared for consideration of the Cabinet.

1.4 At the time of project appraisal, the demand for electricity countrywide was growing fast and diesel generators were installed near the load centres. However, with the rising price of oil, the operation of diesel generators became increasingly expensive, making it imperative to expand the national high voltage grid to facilitate the transmission of the relatively cheaper hydro-electricity. Among the fast growing regions were the Arusha and Kilimanjaro regions. A study commissioned by the Tanzania Electric Supply Company Limited (TANESCO) in 1985 concluded that the Arusha region would need to be connected to the 220 kV system by 1995. The Company then contracted a consultant to study the possibility of connecting Singida line to Arusha via a 220 kV.

1.5 In August 1990, the Government of Tanzania requested the Bank Group to consider financing the foreign exchange costs of the project. A preparatory mission visited the country on December 1990, followed on September 1991 by Project Appraisal Mission, after confirmation by the Bank of co-financing. The project was co-financed by the African Development Fund (ADF), the Nigerian Trust Fund (NTF), the Nordic Development Fund (NDF) and the Danish International Development Agency (DANIDA)

1.6 This PCR is based on the appraisal report, project files in the Bank, Borrower's quarterly progress reports and PCR, interviews and site inspection conducted during an ADB mission to Tanzania on December 2006.

2. PROJECT OBJECTIVE AND FORMULATION

2.1 Project Objectives

2.1.1 The main objectives of the project are to render a cheap and reliable electricity supply to the Arusha and Kilimanjaro regions to alleviate the poor voltage conditions and frequent interruptions due to overload which have resulted from inefficiency in the existing supply system. The specific objectives are to: i) strengthen high voltage grid of Tanzania by extending the North West Network, connecting the existing Singida and Arusha sub-stations with a 220 kV single circuit line to mitigate the acute problem of low voltages, unreliable power supply and severe load shedding in Arusha and Kilimanjaro regions; ii) meet the suppressed and fast growing demand by providing materials for rehabilitation and extension of Medium Voltage and Distribution System, hampered so far by TANESCO'S foreign exchange constraints; and iii) develop new rural

electrification networks in Arusha and Kilimanjaro regions to provide electricity to seven new rural centres and two district headquarters.

2.1.2 The objectives are in line with Tanzania's wider objective of improving infrastructure to facilitate national development; and form part of the Government's policy to increase access to electricity to the rural population within the context of poverty alleviation strategy.

2.2 Description of the Project

2.2.1 The main components of the project were: (i) construction of 220kV transmission line Singida-Babati-Arusha; (ii) upgrading of 220kV substation at Singida and construction of 220kV substation at Arusha; (iii) construction of 220/66/33/11 kV substation at Babati, construction of 66/33/11 kV substation at Kondoa, construction of 66/33 kV substations at Mbulu and Karatu; (iv) construction of 66 kV, 33kV and 11kV and LV distribution lines & supply of services lines with meters; (v) construction of distribution substations; (vi) rehabilitation of Moshi and Arusha distribution; (vii) supply of tools and equipment; (viii) supply of vehicles; (ix) training of staff; and (x) engineering, design and supervision.

2.2.2 There were savings in the implementation of the project. The Bank's approved Government request to use the savings for extension of the grid, which became Phase II of the project, while the original project became Phase I. The components for Phase II of the project comprised: (i) construction of 300 km of 33 kV lines; (ii) construction of 49 km of low voltage lines; (iii) construction and installation of 52 distribution transformers; (iv) construction and installation of 600 service lines with meters; (v) installation of 75 street lights; and (vi) engineering, design, supervision and project management.

2.3 Project Formulation: Preparation, Appraisal, Negotiation, and Approval

2.3.1 The identification of the Electricity IV Project was based upon the 1985 study commissioned by TANESCO, while the preparation was based on the feasibility study also commissioned by TANESCO in 1989 - both referred to in paragraph 1.3.

2.3.2 At that time the thrust of the Government's development plan included addressing the pressing structural and institutional issues in the key areas of infrastructure.

2.3.3 In August 1990, the Government of Tanzania requested the Bank Group to consider financing the foreign exchange costs of the project. A preparation mission visited Tanzania on December 1990, followed by Project Appraisal Mission on September 1991. Before then there had been consultations to ensure that co-financing was secured. The ADF loan of UA 23.026 million and NTF loan of UA 6.00 million were approved on 1st December 1991.

3. PROJECT EXECUTION

3.1 Effectiveness and Start-Up

3.1.1 The ADF and NTF loans were approved on 16th December 1991, while loan agreements were signed on 1st December 1992 and declared effective on 17th August 1994. The loan agreements were signed almost 12 months after approval (beyond the limit of maximum allowable 180 days) and declared effective 32 months after approval (above maximum allowable of 12 months). While there was a long delay in starting the implementation of the project, the delay did not adversely impact the implementation schedule once the project was started. Indeed, there were savings, which were used for Phase II of the project. There was no need to re-appraise Phase II.

3.2 Modifications

3.2.1 In the course of the project implementation, some modifications were effected in respect of design specification, which were approved by the Bank. These modifications related to the following: i) changes in transformer windings and transformer ratings; ii) changes in voltage levels and in the design as well as construction of sub-stations; iii) reduction in the number of substations constructed; iv) extension of the length of overhead lines; and of the number of substations constructed; (v) type and number of tools supplied; (vi) number of trucks supplied; and vii) reduction in the number of man months for training. See **Annex 3** for further details.

3.2.2 The modifications led to improvements in the functionality of the substations and lines, provided more suitable tools and equipment for the project. The increase in the number of vehicles facilitated the implementation of the project.

3.3 Implementation Schedule

3.3.1 The Project was executed by TANESCO, through a Project Implementation Unit (PIU), established for the purpose; and headed by the TANESCO Rural Electrification Manager as a Project Manager, assisted by a Consultant, TECSULT of Canada. The project Implementation Schedule (Appraisal compared to Actual) is shown in **Annex 4** while the Organisation Charts of TANESCO and TECSULT are shown in **Annex 9**.

3.3.2 There were two sets of delays. First was the delay in loan effectiveness, which meant that the project could not start early, while the second was during implementation i.e. after starting the project. The loan could not become effective because part of the conditions was that co-financing for the construction of the 316 km 220kV line from Singida to Arusha to be financed by DANIDA had to be secured. It took time for this condition to be met. Closer donor coordination and synchronisation of activities could have reduced this delay in loan effectiveness and the Bank should therefore bear part of the responsibility for this.

3.3.3 The second set of delays arose from the long time it took the Borrower/Executing Agency to undertake the procurements in compliance with the Bank rules, and from time overruns during actual construction. The delay in loan effectiveness was for 32 months while total period of construction was 61 months, way above the appraisal estimate of 48 months.

3.3.4 The Project Implementation Unit for Phase I continued to implement Phase II. Part of delays during the Phase II was caused by replacing the cables which had been supplied from an ineligible source by the main contractor. Other delays were caused by a change in sub-contractors and late delivery of wood poles by a local supplier. The implementation of electrification sub-projects was carried out by TANESCO and local contractors. In spite of the delays in commencement and during implementation, the project was generally satisfactorily executed.

3.4 Reporting

3.4.1 The implementation of the project was monitored through monthly progress reports, prepared by the PIU. TANESCO submitted quarterly progress reports, prepared by the Consultant. A total of 18 quarterly progress reports were submitted covering the periods January 1995 to 31 March, 2000 for Phase I and from February 2002 to September 2005 for Phase II. The progress reports covered work in progress, schedule and cost control, work forecast and key actions. They also highlighted the problems encountered during implementation of the project that required the Bank's attention. The reports were unsatisfactory. They were deficient in financial reporting in that

project cost per components, donor funds and GOT contributions to reporting dates were not reflected.

3.4.2 There were also the Consultant's final project report and the Borrower's PCR both of which did not follow the Bank's guidelines. The Bank has so far not commented on the compliance of these reports with the guidelines.

3.4.3 Audited financial statements and reports were prepared and submitted in line with loan conditions. Four such reports were submitted between 1996 and 1999, while two were submitted between 2002 and 2005. However, the project audited accounts and reports do not meet the requirements given in the guidelines for audit of Bank financed projects. The Bank failed to review on a regular basis the audited accounts. It was only in November 2004 when the project was winding up, that the Bank conveyed its comments on the accounts for 2002 to the Borrower. Furthermore, the Bank did not apply the relevant sanctions for failure to submit audited accounts on time.

3.5 Procurement

Consultancy

3.5.1 The consultant was selected in accordance with the guidelines of the Bank Group. The contract was awarded to M/S TECSULT in 1994. The Bank approved addendum to the consultancy contract, which remained in force until March 2000. M/S TECSULT continued to provide consultancy services during Phase II up till June 2004 when TANESCO engineers took over supervision to final completion of construction.

Contractors

3.5.2 The procurement of the goods and services for implementing the components in paragraph 2.2.1 above were divided in four packages; a) power transformers, reactors and distribution transformers awarded to Pauwels International N.V Company of Belgium; b) substation construction awarded to ABB Transmit Oy of Finland; c) conductors, insulators and accessories and construction awarded to Kolon International Corporation, South Korea; and d) acquisition and construction of line materials awarded to both ABB SAE S.p.A/ICIL of Italy and the United Kingdom respectively, and Kolon International Corporation, South Korea. All packages were tendered in accordance with international competitive bidding (ICB).

3.5.3 Procurement of materials and equipment for rehabilitation work, financed by NDF was done through competitive bidding restricted to Nordic countries in accordance with the procedures of NDF.

3.5.4 The supply of tools and equipment and of vehicles was done through international competitive shopping, as the amounts involved were small. The contract for the supply of Tools and Equipment was awarded to M/S John Achelis & Shone of Germany.

3.5.5 The contract for the supply of vehicles was awarded to M/S International Motors (Toyota) and M/S Tradex respectively, for lot 1 vehicles (four 4-WD station wagons) and lot 2 vehicles (four 4WD Double Cabin Pick-ups four 4-WD single cabin pick-ups, three 2WD 7-8 tonnes trucks and one 2WD 8-9 tonne truck with a crane).

3.5.6 For Phase II M/S Daewoo International of South Korea supplied distribution transformer as well as line materials. The construction of the lines was undertaken by TANESCO and local contractors.

3.5.7 The procurement of transformers and line materials was in line with the objectives set forth in Phase I of the project, discussed in section 2.2.1 above. The expenditure categories which exist for the procurement of related materials and services under the ADB and NTF loans were utilised to obtain additional materials and services under Phase II. The proposed utilisation of loan savings therefore did not require the introduction of a new category of expenditures. The construction of 33 kV line for rural electrification was technically sound and consistent with the objectives of Phase I.

3.6 Financial Sources and Disbursements

3.6.1 At appraisal in 1991, the estimated overall cost (net of all taxes) of the project was UA 81.656 million (TShS 24,789.8 million) of which the foreign exchange cost was UA 69.962 million (TSh 20,943.7 million) or 84.45 % of the total and the local cost was UA 12.694 million (TSh 3,855.1 million) or 15.55 % of the total. The actual overall cost at completion was UA 71.551 million of which the foreign exchange cost was UA 64.115 million or 89.61 % of the total and the local cost was UA 7.436 million or 10.39 % of the total. The overall actual project cost is summarised by component and source in **Annex 5** while Table 3.1 below shows the project financing plan.

Source	Appraisal				Actual			
	FE	LC	Total	%	FE	LC	Total	%
ADF	23.026	0	23.026	28.20	21.011	0	21.011	29.37
NTF	6	0	6	7.35	4.504	0	4.504	6.29
DANIDA	35.949	6.239	42.188	51.67	34.613	4.095	38.708	54.10
NDF	3.987	0	3.987	4.88	3.987		3.987	5.57
GOT	0	6.455	6.455	7.91	0	3.341	3.341	4.67
Total	68.962	12.694	81.656	100.00	64.115	7.436	71.551	100.00
%	84.45	15.55	100		89.61	10.39	100	

3.6.2 The project is co-financed by ADF, NTF, NDF and DANIDA. The Government of Tanzania financed part of the local costs. The DANIDA financed component involving the construction of 316 km 220 kV Singida-Babati-Arusha line and 220/132 kV substation at Arusha plus upgrading of 220kV substation at Singida was completed in 1997 while the rehabilitation works financed by NDF were completed in 2000. The Bank Group financed components were also completed in 2000. As noted in paragraph 2.2.2, the Bank approved the utilization of UA 4.6 million out of loan savings for the provision of electricity services, with estimated total cost of UA 6.26 million, to additional farm houses/lodges, villages and rural towns in the project area.

3.6.3 The completion cost of UA 21.011 million and UA 4.504 million for the ADF and NTF components of the project respectively (both Phases I and II), was still less than the approved loan amount. At the end of implementation of the project savings of UA 2.015 million and UA 1.496 million respectively were realized under the ADF and NTF loans, and the Bank with the consent of the Government, had cancelled these balances. The reduction in the completion cost vis-à-vis appraisal estimates was due to a number of factors. There was keen competition and submission of cost effective competitive offers by the bidders. Besides, the design modifications, the use of TANESCO construction teams for both supervision and construction, and local contractors during the second phase, coupled with the non completion of part of the training components led to the cost savings. Overall, there was a cost under-run of about UA 4.38 million and under the ADF and NTF financed packages of the project.

3.6.4 The loan funds were disbursed by direct payments method of disbursements to the project contractors and consultant. Disbursements of ADF and NTF fund were made over a period of six years from 1995 to 2000 for Phase I and further five years up till 2005 for Phase II, as against planned period of 1992 to 1996. This was due to the delayed implementation and the extensions granted following the approval of the second phase for the project. **Annex 6** presents the disbursement profile at appraisal compared with actual. There were reported cases of delayed processing of contractors certificates by the Borrower for submission to the Bank but these were not significant. The Company's contributions were paid from the internally generated resources and the Company was able to fulfil its financial obligations under the project without delay.

4. PROJECT PERFORMANCE AND RESULTS

4.1 Overall Assessment

4.1.1 The project was satisfactorily executed. The Executing Agency (EA) and Borrower in consultation with the Bank had provided appropriate responses and solutions to the problems which arose in the course of implementation. Coordination and efforts of all parties involved (Bank, Co-financiers, Borrower, Executing Agency, Contractors and Consultants) was in general effective which resulted in successful completion of the project.

4.2 Operating Results

4.2.1 The objectives of the project have been met: now there is a better system, with improved voltage profile. About 75% of the districts in the region are now connected. The project has electrified fifteen townships, several development centres, industries, tourist hotels, settlements and 30 villages contributing immensely to the growth in TANESCO consumer population. As shown in **Annex 8**, consumer population nationwide grew by 191% from 155,284 in 1990 to 452,617 in 2001, and thereafter by an annual average of 6.9% reaching 590,285 in 2005 with the project areas accounting for about 25% of the increase. Furthermore, the project has successfully mitigated the problems of low voltage, unreliable power supplies, and consequent load shedding in Arusha and Kilimanjaro regions.

4.2.2 All the components Phase I were implemented except for parts of the training component. Three levels of training had been envisaged: (i) on the job training; (ii) as part of the tasks for consultant; (iii) over and above this was training for engineers in specific areas of expertise such as project management. Item (i) was fully implemented, but items (ii) and (iii) had to be discarded because of TANESCO's preference for a particular training consultant and country of training.

4.2.3 The delays in the implementation referred to in paragraph 3.3.3 did not adversely affect the project cost rather savings were utilised for the provision of additional electricity services.

4.3 Institutional Performance

4.3.1 The Executing Agency (EA) at appraisal was MEM while TANESCO was the Implementing Agency. Both the EA and PIU were effective in carrying out their responsibilities in the implementation of the project. The institutional performance and impact are summarised in **Annex 7** while the key points are highlighted in the paragraphs below.

The Electric Power Sector Reforms

4.3.2 The reforms that were undertaken by the Government spanned the entire period of project implementation. However, these have not impacted negatively on the implementation and outcomes of the project, but rather on TANESCO itself with investment in the Company slowed down, recruitment frozen and the training centres closed down.

4.3.3 The management of the Company was outsourced to the Net Group Solutions Pty of South Africa for a period of four years to turn around, unbundle and prepare for privatisation. The management contractor however failed in achieving the set objectives and indeed created some of the current problems of TANESCO such as the problematic accounting and billing software. Following the failure of the management contractor, the Company is in need of further reform to strengthen its management capability and improve its financial situation but the Government is still not explicit on the direction it wants to take regarding the unbundling.

4.3.4 The committee on privatisation visited other countries to share their experience on the process and came to the conclusion that, because of the relatively small size of the power system in the country, privatisation was not appropriate at that time. The Government therefore suspended the privatisation programme as well as the unbundling process of the Company, as per Government Notice No. 373 published on 18th November 2005. The issue of electricity sub-sector reforms, including liberalisation, in Tanzania and indeed other African countries is a complex one, requiring further studies and evaluation to come up with approaches best suited to conditions obtaining in these countries.

4.3.5 There is now a regulatory framework in place with the establishment of the Energy and Water Utilities Regulatory Authority (EWURA) to regulate the operations of TANESCO and other players including Independent Power Producers (IPP). The entry of the IPPs is a welcome development especially in this time of electricity supply crisis and as a manifestation of private sector participation in energy sector investment. However, most of the IPPs have come in at a time when Tanzania was through and energy crisis requiring emergency action by the Government, and are, therefore, coming in under conditions that are most favourable to them.

Tariff Policy and Structure

4.3.6 The current tariff is around US\$ 0.08 / kWh well below the level of the 1985 level of twelve United States cents per Kilowatt-hour (US\$ 0.12 / kWh). The current tariff structure in the country is inadequate as TANESCO is still unable to recover its operating expenses, and the Government has had to provide the much needed subsidy. Debate is a raging on the kind of tariff most suitable for the current situation in the country. There is a need to ensure sustainability of the operations of TANESCO and availability of funds for the operations and maintenance, and future investment in the infrastructure. Furthermore, the IPPs are exerting pressure on the company with the higher tariffs because of the costlier thermal generating plants. The tariff studies that have been done should be updated and made as comprehensive as possible to provide a basis and rationale for any future increases.

Accounting and Budgeting

4.3.7 TANESCO uses three software packages, which were not integrated thus leaving a gap to be filled via manual processes. The accounting and billing packages were sluggish while the inventories package sub-system never functioned resulting in improper accounting for stocks, and there were occasional system breakdown resulting in arrears of data entry. Unless urgent decisions are taken and followed up with concrete actions, there could be a complete breakdown of the accounting and management information system. The vendors have been invited to assist in resolving problems. Despite the reported sluggishness of the software, the Finance Department was

able to generate the required accounting and management information report in good time to enable management and board take timely decisions.

4.3.8 The budgeting and budgetary control system, which was independent of the software, was functional with annual budgets prepared and used for controlling expenditure.

Auditing

4.3.9 As stated in paragraph 3.4.3, the project audit report and accounts, which were submitted, did not meet loan conditions. The separate audited accounts of the ADF and NTF loans for the year ended 31st December 2004 specifically focused on the respective loans, were not consolidated and did not give a full picture of the state of affairs of the whole project.

Billings and Collection

4.3.10 The concern expressed during appraisal on the need for effective billing and collection policy and procedures remains. One of the unfulfilled loan conditions relate to reduction of Accounts receivable to a level of not more than 2 months of Sales by 31st July 1994. Although the levels have been fluctuating, total Accounts Receivable stood at Tsh 209.65 billion as at the end of 2006, almost 12 months of Sales. The age analysis shows a common pattern among all categories of consumers implying that energy sales volume as well are along similar pattern. **Annex 8** shows the trends over the period.

4.3.11 Part of the project objectives was to increase sales of electricity to the Industrial and Commercial consumers. The statistics however show that bulk of the sales still go to the private consumer rising from 75 % at appraisal to 85% at PCR. Since energy supply is a key to economic and industrial development, TANESCO should focus on higher sales to that segment while ensuring full and prompt recovery of amounts billed. Sales value could be increased further by adjusting the tariff structure to reduce cross subsidy to Industrial and Commercial consumers. TANESCO has already constituted a task force to clean up its Accounts Receivable.

4.4 Management and Organisational Effectiveness

4.4.1 The organization and management structure TANESCO remains as described at appraisal except slight modifications. The current organization structure of the Company and TECSULT project organization chart for the project are shown in **Annex 9**. For effective implementation of the project, a Project Implementation Unit (PIU) was established within TANESCO. Within the project, the supervising consultant, TECSULT, was responsible for the engineering, design, support drawings, plan and profile drawings and preparation of bidding documents, bid evaluation, project monitoring and supervision. The project has a training component and implementation include training to enable the Company's personnel take over from the consultant and contractors with capacity to be able to run the facilities. This has implications for the project sustainability. The supervision consultant completed its mandate in June 2005 before completion of phase II of the project, and left the site. Thereafter TANESCO engineers and technicians took over and played the dual roles of being both a Client and Consultant for all Projects activities that were still on progress. On the whole, the project management arrangement was effective.

4.5 Staff Recruitment, Training and Development

4.5.1 The move towards liberalisation affected the human resource development, including training programme of TANESCO. Recruitment was suspended, funding for training curtailed and the training facilities closed down. In any case, there has over the years been no effective policy for capacity building but the situation is changing. A training policy has now been developed and specific proposals made for the training of technicians and artisans. The most recent training activities of the Company is presented in Table 4.1.

TRAINING PERFORMANCE 2001 – 2005					
YEAR	LOCAL		OVERSEAS		TOTAL
	SHORT	LONG	SHORT	LONG	
2006	191	114	50		355
2005	943	52	36	1	1032
2004	1506	37	40		1583
2003	807	4	23		834
2002	70	8	57	4	139
2001	1029	6	40	6	1081
TOTAL	4546	221	246	11	5024

4.6 Performance of Consultants and Contractors

4.6.1 Overall the Consultant performed satisfactorily during implementation of the project. There was good coordination in the execution works between the Consultant and the Contractors throughout the execution of the project. The performance of the Consultant in the design and supervision, bid management and negotiation of contracts was satisfactory.

4.6.2 There were, however, incidents of oversight; e.g. inadequate contingency measures in regard to NOR-ICIL's problem of not meeting completion time targets. There were also minor lapses in Phase II, e.g. some of the design and profile drawings had to be revised to correct inconsistency in design observed during the pegging operation. .

4.6.3 The performance of most of the manufacturers and suppliers was satisfactory. The technical performances of the contractors in the execution of works especially the quality and workmanship were satisfactory. However, NOR-ICIL had difficulty in meeting overall as well as revised monthly targets in the construction of 33 kV lines. Some of the contractors also had lapses in the quality of service. For example, some of the items supplied by M/S Kolon of South Korea had deviated from specifications.

4.6.4 There were delays in meeting the schedule by one supplier for nails and caps, and extra poles. In the course of project implementation, changes in the subcontractors for the supply of materials (cables) led to delays in project completion.

4.6.5 TANESCO had the required capacity and qualified construction teams to implement the proposed works within the specified time frame and performed the task satisfactorily. The performance of the local contractors was satisfactory although a few of them had a poor financial base which caused start up delays. The capacity of the local contractors so engaged has been enhanced even though this was not a primary objective of the project. However, as noted in paragraph 3.3.4, there was delay in the delivery of wood poles by a local supplier.

4.7 Conditions/Covenants

4.7.1 The loan covenants/conditions provided a basis for the execution of the project. The Borrower was, however, unable to fulfil two out of the original loan conditions namely: i) ensure that TANESCO implements 15% biannual tariff increase till such a time that the average tariff in real terms reaches the 1985 level of twelve United States cents per Kilowatt-hour (US\$0.12/kWh); and ii) cause TANESCO to submit to the Bank a plan of action not later than March 31, 1992 for liquidation of outstanding receivables such that the average receivables will be reduced to a level of not more than two months of sales by 31 July 1994.

4.7.2 Although the government increased the tariffs several times since 1992, the average has not reached the 1985 level. The circumstances surrounding non-fulfilment of this loan condition are discussed in paragraphs 4.3.7. The reason given was that the tariffs declined in real terms between 1985 and 1991 due to the deterioration of the Tanzania shillings over that period and as such there was a need for tariff adjustments to reach that level where TANESCO was able to cover its operations and maintenance costs. While the reason was tenable, a biannual increase of 15% was not practicable as the appraisal analysis did not take into account the potential negative socio-economic implications of such action. The condition therefore appears inappropriate.

4.7.3 Concerning the second unfulfilled loan condition, the Borrower/TANESCO prepared action plans and took steps towards recovery at different times but these do not translate to reduction of Accounts Receivable to a level of less than 2 months sales. Analysis of Accounts Receivable and recommended actions are discussed in paragraphs 4.3.13 and 4.3.14. This condition was appropriate and future Bank intervention should ensure that actions are taken on collection and where need be Bank assistance should be provided.

4.8 Economic Performance

4.8.1 At appraisal, the project economic justification was evaluated based on two scenarios namely a) the total construction costs for the whole project and b) total cost excluding DANIDA and NDF components. The analysis was conducted using 1991 prices, assuming implementation would commence in January 1992 and would last for 48 months to December 1995. The calculation of economic internal rate of return (EIRR) was therefore based upon projections for 30 year from 1992 to 2021. Based on the economic costs and benefits, the resulting EIRR of the project was estimated at 14 % for the whole project and 27 % excluding DANIDA investment.

4.8.2 The methodology adopted at appraisal has been used in the re-calculation of the EIRR at PCR. However, since the project implementation did not take off until 1992 as planned, the streams of benefit could not materialize until 1999. The retrospective calculations at PCR are based upon actual investments and expenditures from 1995 to 2005 and revised forecast up to 2021. While the assumptions at appraisal are held constant for retrospective calculation at PCR takes into account, the total project cost including the DANIDA and NDF packages because the Bank Group component could not stand alone as the DANIDA component is the backbone of the project. On this basis, the recalculated EIRR at PCR is 6.39% compared to appraisal figure of 14%. A 10% increase in revenue would raise the EIRR to 8.95% while a 10% increase in Operations and maintenance cost would reduce it to 3.66%. The table of EIRR computations is given in **Annex 10** while the assumptions and analysis are given in **Annex 11**.

4.8.3 This EIRR is lower than the opportunity cost of capital of 11% in Tanzania, because most of the benefits expected to contribute have not been captured due to the following reasons: (i) data was not available to enable all the new major industries and agricultural enterprises that have come up in the region have been reflected; ii) the productivity of these industries and enterprises which

has no doubt stimulated growth and economic activity leading to enhanced employment and income generation; iii) data is not readily available on the fast growing informal sector and its impact on income as well as employment generation; and iv) it is difficult to quantify the full level of social benefits e.g. education, provision of water services.

4.9 Financial Performance

4.9.1 The project was evaluated at appraisal on three project scenarios namely a) total construction costs for the whole project, b) total cost excluding DANIDA and NDF components, c) total cost including only 20% of DANIDA costs. The appraisal analyses gave a financial internal rate of return (FIRR) of -2.11%, 8.3 % and 6.8 % respectively for the three scenarios.

4.9.2 The retrospective financial internal rate of return (FIRR) at PCR calculated adopting assumptions and arguments similar those indicated in paragraph 4.8.2 gives an FIRR of 4.09% compared to (-) 2.11% at appraisal. A 10% increase in revenue would raise the EIRR to 6.75% while a 10% increase in Operations and maintenance cost would reduce it to 1.28%. The table of FIRR computations is given in **Annex 9**. The low FIRR is caused by the lower positive streams of cashflow resulting from the narrow operations margin given by the current level of tariffs at TANESCO.

4.9.3 The facts on the ground suggest that the Company is technically insolvent. The financial situation of TANESCO is beginning to affect the operation of its power system. Apparently many of the problems such as non replacement of defective parts or equipment that have been reported but not acted on may be traced to the Company's tight financial situation, as a result of funds having had to be diverted to 'more pressing requirements'. The summarised historical financial statements and analysis thereof are included in **Annex 11**.

5. SOCIAL AND ENVIRONMENTAL IMPACT OF THE PROJECT

5.1 Social Impact

5.1.1 The project addressed the need for electricity in the Arusha-Kilimanjaro regions where more rapid development is evident and enhanced the supply of electricity in the regions. 75% of the districts headquarters in the region are now connected. The connections have improved income generation of coffee farmers and sugar cane plantations; and employment generation of the farm workers and thus played a beneficial role in poverty eradication. The productivity of industries, commerce and agro-based businesses has improved.

5.1.2 The introduction of electricity to rural areas provides basic services such as lighting; encourages the use of convenient appliances, as well as labour saving and income generating ones; encourages the establishment of small rural scale industries, which generate employment and income leading to increased economic activities and reduced poverty; and ensures improved delivery of social services including adult education, improved lighting to schools for better as well as improved use of computers and communications technologies.

5.1.3 The provision of electricity has facilitated the establishment of repair workshops and flour mills and reduced the use of privately owned diesel generating plants giving rise to cost cuts and improved profit margins.

5.2 Environmental Impact

5.2.1 A detailed environmental impact assessment (EIA) was done by a consultant engaged by the Bank. The main conclusions of the study were the: a) planned route of the proposed line, which follows the Singida-Babati-Arusha road, was well chosen as it would not interfere with existing settlements, agricultural areas, natural parks, game reserves, road reserves and tourist amenities; b) extra high voltage transmission lines could produce corona discharges under certain weather conditions; audible noise; ozone and nitric oxide; nevertheless these effects would be negligible or non-existent on the line because the strengths of the electric field would be too low; c) proposed line would not significantly affect flora and fauna of the project area; there would be limited environmental effect during construction; and d) some areas of prehistoric significance would be touched.

5.2.2 TANESCO complied with all the requirements during construction. Effort was made to minimize environmental impact during construction. The impacts during construction were adequately addressed through proper site coordination and scheduling of construction phases. The project team consulted with the museum authorities during project implementation to ensure that the sites of historical significance were protected.

5.2.3 With the connections, many of the customers, particularly industrial ones, discarded the use of expensive and more polluting self owned diesel generators.

6. PROJECT SUSTAINABILITY

6.1 The main issues critical to the sustainability of the project are: (i) improvements in the power system; (ii) restructuring of TANESCO; (iii) tariff structure; (iv) increased investment in the power sub-sector; (v) capacity building in the power sub-sector; (vi) operations and maintenance of the electricity system; and (vii) power system losses.

6.2 GOT commitment to increasing generation capacity, strengthening transmission system and expanding distribution networks will have a positive, indirect impact on the sustainability of the project.

6.3 The poor operational, financial, management capacity and structure of TANESCO negatively impact the sustainability of the project.

6.4 Tariff increases to date have not been sufficient in providing the revenues to ensure the company's viability. The current structure of tariffs in the country endangers the viability of TANESCO and thus negatively impacts sustainability of the project.

6.5 Increased investment in the electricity sector is a prerequisite for the sustainability of the project. As shown in **Annex 12** about \$1.6 billion would be required for investment in the power sector over the next 27 or so years. The donors, including the Bank, can play a critical role in boosting investment to meet requirements in the sector. Public-private sector partnerships would also increase sector investment in the energy sector.

6.6 The availability of qualified and experienced staff is a pre-requisite for successful operation of the distribution system and sustainability of the project and the whole system. Capacity building, continuous education and training are critical in this context.

6.7 Proper and effective maintenance and operation strategies in the distribution system have a positive impact on the sustainability of the project and the whole system. This means speedy and regular maintenance, repair or replacement of faulty equipment. Instances of poor maintenance in the project areas were noticed by the PCR

6.8 Both technical and non-technical distribution system losses in the project areas and in the country as a whole are high (30% or more). High losses adversely affect the sustainability of the project and of the country's distribution system.

7. PERFORMANCE OF THE BANK, THE BORROWER AND EXECUTING AGENCY

7.1 Performance of the Borrower/Executing Agency

7.1.1 The Borrower was the Government of Tanzania while the Executing Agency was MEM. On the whole, the Borrower's performance is rated as satisfactory. As earlier discussed in section 4.7, the Borrower was unable to fulfil two out of the original loan conditions.

7.1.2 The Executing Agency maintained close working relationship with and provided appropriate guidance to the PIU during the course of the project implementation.

7.1.3 There was constant supervision of the project works at every stage by the PIU assisted by the Consultant to maintain the quality of works. Long time was taken by the PIU to implement the initial bidding; this led to unnecessary delays in the start of the project. This was done satisfactorily.

7.1.4 As mentioned in paragraph 6.8, there were examples of laxity in the maintenance of distribution facilities within the project area by TANESCO.

7.1.5 Long time was taken to complete the requirements for selecting TANESCO engineers for training. As a result, the component of the project was not fully implemented. Moreover, unnecessary delays in processing payment certificates by the Executing Agency were reported by the contractors.

7.2 Performance of the Co-Financier

7.2.1 The components financed by DANIDA were completed in 1997 while the NDF component was completed in 2000. As stated in paragraph 3.3.2, the ADB loan effectiveness was delayed because of the need to await commitment of DANIDA to commencing its own components. The delay here was caused in part by inadequate donor coordination and synchronisation of activities. However, details of the implementation of components financed by the two other donors were not available.

7.3 Performance of the Bank Group

7.3.1 The project was in line with the Borrower's priorities and with the Bank's policy, goals, objectives and strategies for strengthening the electricity sub-sector, including rural electrification and with the Bank's policy of providing assistance in such areas. The project was well conceived and designed. The Bank performed well during the preparation of project appraisal in identifying issues requiring attention to ensure the success of the project and putting in place ways of addressing them. However, the loan could not become effective because Bank's funded portion had to wait until the DANIDA funded project started. As stated in paragraph 3.3.2, the Bank should bear part of the responsibility for the delay.

7.3.2 Since the project's inception, the Bank carried out regular desk monitoring of the project and the Borrower/ Executing Agency received from the Bank regular supervision visits. The missions provided valuable assistance to the project, Borrower/Executing Agency and the Bank in the successful implementation of the project. The Borrower/Executing Agency received the necessary guidance and advice to ensure proper procurement of goods and supervision of the works. The skill mix of the supervisory missions was balanced during the early stages of project implementation, but limited to a power engineer in the later stages. This brings to question the extent to which other aspects of project implementation, especially financial ones received adequate attention. The review of the procurement process by the Bank was satisfactory though procurement processing lasted longer than programmed. The overall performance of the Bank during the implementation of the project was satisfactory.

8. OVERALL PERFORMANCE AND RATING

Assessment of Overall Project

8.1 The additional infrastructure provided by this project namely high and low voltage lines and substations, meet international standards. It has strengthened the national grid and alleviated the problems of low voltages and frequent breakdowns identified at appraisal.

8.2 The overall impact of the project is being felt mainly in the rural areas where over 60% of population live and by the industrial, commercial and agricultural businesses. See detailed discussion in section 5.

Performance Rating of the Bank Financed Package

8.3 In accordance with the implementation performance indicators (Annex 8), the overall assessment of implementation performance of the Bank financed package is satisfactory with a rating of 2.6 out of 4 maximum. The rating for the Bank's performance is 2.67 out of 4 maximum indicating satisfactory while the rating for the project outcome is satisfactory with a rating of 2.67 out of 4 maximum. In general, the overall performance of the project is satisfactory.

9. CONCLUSIONS, LESSONS LEARNED AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 The project objectives have been met. The project was well formulated and attracted co-financing by the Bank Group as well as DANIDA and NDF. However, there was a delay of 32 months in starting the project. Economic and social situations have improved since appraisal, resulting in rapid growth in electricity demand, prompting expansion of the electricity system. However, the expansion of the distribution system in the country has not kept pace with the rapid growth in demand.

9.1.2 Although GOT has initiated actions to reform the energy sector the privatisation of TANESCO has been suspended; the management and financial positions of TANESCO are still weak.

9.1.3 The current tariff structure in the country is inadequate. TANESCO is still unable to recover its operating expenses, and the Government has had to subsidize the company. The requirements for investment in the electricity sector in Tanzania are large and growing, requiring the Government to create an enabling environment for private sector investment.

9.1.4 Both technical and non-technical distribution system losses in the project areas and in the entire country are high and will negatively impact on project sustainability. So will the examples of poor maintenance and system operation in the project areas.

9.2 Lessons Learnt

9.2.1 The lessons learnt from this project are given hereunder.

- Closer co-ordination and synchronisation by the Bank of activities with those of other donors would have reduced the delay in loan effectiveness that occurred on this project. (para. 3.3.2)
- Delays during implementation would have been reduced had the Borrower been better appraised of the Bank's procurement rules and procedures. (para.3.3.3)
- The Bank ought to have ensured that the observed lapses in the audit reports were rectified. (para. 3.4.3)
- More rigorous examination of loan conditions, and, where necessary, provision of technical assistance, would ensure appropriateness of the conditions.(para 4.7.2)
- An earlier study and appreciation of the liberalisation process by the Borrower would have minimised the negative impact on TANESCO. (para. 4.3.2 & 4.3.4)
- A baseline study on socio-economic profile of the project areas would have provided a bench mark for evaluating the effectiveness of the project after completion. (para.4.8.3)

9.3. Recommendations

9.3.1 It is recommended as follows:

For the Borrower

- The Government effort to develop rural electrification should be done within the framework of national electricity development strategy, which in turn must be part of the overall national energy policy and strategy; (Para 1.3)
- The conclusions and recommendations of many studies undertaken in the past should be updated, coordinated and harmonised to chart the direction for the country's energy/ electricity policy; (Para. 1.3)
- The Government should create an enabling environment for private sector investment to help meet the fast growing requirements for electricity in the country; (para. 6.5)
- Time bound plans should be put in place to reduce the technical and non-technical losses as a matter of urgency; (Para 6.7)
- GOT should study the cost effectiveness of IPPs and their impact on tariffs; (para 4.3.6.)
- Tariff studies done in the past should be updated on a comprehensive basis to provide a rationale for any future increases. (para 4.3.6)
- GOT should further reform and restructure TANESCO to enhance its management capability and improve its weak financial situation; (para 4.9.3 & 6.3)
- Effective operation and maintenance approaches should be nurtured and implemented in order to ensure sustainability of the power system; (para 6.8)
- In the future, GOT should undertake baseline study on project areas to provide a bench mark for evaluating the effectiveness after completion; (para.4.8.3)

For the Bank

- The Bank should ensure that audit reports submitted by Borrowers are forwarded to the office of the Auditor General for review and comments, which should promptly be conveyed to the Borrower. (para. 3.4.3 and 4.3.7)
- The reform of public utilities and accounts receivable in African countries should be studied with a view to finding approaches best suited to the conditions in these countries. (para 4.3.4 & 4.3.10)
- The Bank and other donors should play a more central role in boosting investment to meet the growing requirements in the electricity sub-sector (para. 6.5)

A matrix of recommendations and follow up is presented in **Annex 11**.

MAP OF TANZANIA



TANZANIA

ELECTRICITY IV PROJECT - PROJECT COMPLETION REPORT



**DEMAND AND CONSUMPTION FORECAST
(FOR ELECTRICITY YEAR 2002 TO 2030 - Grid System (MWh))**

Assuming full industrial List

	Actual 2002	Actual 2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025	2030
GENERAL USE ENERGY																	
Residential, Small Comm. & Lt. Industrial	1,114,261	1,156,991	1,345,207	1,469,542	1,605,273	1,753,448	1,900,944	2,038,383	2,161,867	2,290,538	2,424,619	2,564,335	2,709,927	2,861,643	3,721,531	4,778,403	6,077,670
Identified Rural Electrification	0	0	1,450	1,584	1,730	1,890	2,049	2,197	2,330	2,469	2,613	2,764	2,921	3,085	4,011	5,151	6,551
TOTAL GENERAL USE (MWh)	1,114,261	1,156,991	1,346,657	1,471,126	1,607,004	1,755,338	1,902,993	2,040,581	2,164,197	2,293,007	2,427,232	2,567,100	2,712,848	2,864,727	3,725,543	4,783,554	6,084,221
Annual Growth Rate		3.8%	16.4%	9.2%	9.2%	9.2%	8.4%	7.2%	6.1%	6.0%	5.9%	5.8%	5.7%	5.6%	5.4%	5.1%	4.9%
INDUSTRIAL ENERGY																	
Identified Existing Industrial	952,460	1,113,417	1,031,808	1,077,724	1,125,567	1,175,419	1,227,365	1,281,492	1,337,893	1,396,664	1,457,906	1,521,722	1,588,221	1,657,518	2,050,274	2,533,003	3,126,447
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	60,094	114,179	147,447	163,249	170,464	177,981	185,815	193,977	202,483	211,346	220,582	230,206	284,754	351,799	434,220
New Industrial Loads - Low Growth	0	0	5,979	103,018	473,500	596,610	1,061,966	1,231,880	1,231,880	1,231,880	1,231,880	1,231,880	1,231,880	1,231,880	1,231,880	1,231,880	1,231,880
TOTAL INDUSTRIAL (MWh)	952,460	1,113,417	1,097,881	1,294,920	1,746,514	1,935,278	2,459,794	2,691,353	2,755,588	2,822,522	2,892,269	2,964,948	3,040,683	3,119,604	3,566,909	4,116,682	4,792,547
Annual Growth Rate		16.9%	-1.4%	17.9%	34.9%	10.8%	27.1%	9.4%	2.4%	2.4%	2.5%	2.5%	2.6%	2.6%	2.7%	2.9%	3.1%
PUBLIC LIGHTING	3,182	2,535	3,842	4,197	4,585	5,008	5,429	5,822	6,175	6,542	6,925	7,324	7,740	8,173	10,629	13,648	17,359
Annual Growth Rate		-20.3%	51.6%	9.2%	9.2%	9.2%	8.4%	7.2%	6.1%	6.0%	5.9%	5.8%	5.7%	5.6%	5.4%	5.1%	4.9%
BULK SALES	132,905	144,707	157,522	171,253	185,419	200,366	214,966	228,685	241,143	254,124	267,651	281,746	296,434	311,740	398,490	505,113	636,190
Annual Growth Rate		8.9%	8.9%	8.7%	8.3%	8.1%	7.3%	6.4%	5.4%	5.4%	5.3%	5.3%	5.2%	5.2%	5.0%	4.9%	4.7%
TOTAL CONSUMPTION	2,202,809	2,273,510	2,605,902	2,941,496	3,543,522	3,895,991	4,583,183	4,966,441	5,167,102	5,376,195	5,594,076	5,821,118	6,057,706	6,304,245	7,701,571	9,418,997	11,530,317
Annual Growth Rate		3.2%	14.6%	12.9%	20.5%	9.9%	17.6%	8.4%	4.0%	4.0%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
LOSSES																	
Technical Losses*	-	-	317,793	315,160	354,352	339,767	399,696	433,120	450,619	468,854	487,856	507,656	528,288	549,789	671,649	821,424	1,005,551
Loss Rate (%)	-	-		9.0%	8.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Non-Technical Losses*	-	-	254,234	245,125	270,975	294,464	346,403	375,371	390,537	406,340	422,808	439,968	457,850	476,484	582,095	711,901	871,477
Loss Rate (%)	-	-		7.0%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%

Source: Power Master Plan 2003 update

**DEMAND AND CONSUMPTION FORECAST
(PROJECTED TOTAL ELECTRICITY CONSUMPTION BY REGION YEAR 2002T0 2025 -Total Consumption (MWh))**

Reference Case [Reduced Industrial List]

	Actual	Actual														
Branch	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020	2025
Arusha	171,543	183,671	202,686	218,346	570,007	675,194	1,025,507	1,163,207	1,178,439	1,194,312	1,210,851	1,228,086	1,246,046	1,264,761	1,370,835	1,501,207
Dar es Salaam	1,179,996	1,293,353	1,425,200	1,560,389	1,700,075	1,849,068	1,994,076	2,127,670	2,245,079	2,367,422	2,494,908	2,627,752	2,766,183	2,910,436	3,728,030	4,732,917
Morogoro	81,783	85,834	90,818	95,366	100,077	104,337	109,326	114,889	121,099	127,570	134,313	141,339	148,661	156,290	199,533	252,682
Moshi	110,975	125,996	140,594	156,132	173,182	191,885	209,832	225,673	238,526	251,919	265,874	280,417	295,571	311,362	400,864	510,870
Tanga	126,400	133,632	144,085	151,656	158,948	166,742	175,173	184,046	193,394	203,135	213,285	223,862	234,884	246,369	311,465	391,473
Bukoba	16,511	17,980	19,355	21,244	23,935	26,662	27,944	29,377	30,981	32,651	34,392	36,206	38,096	40,066	51,230	64,951
Dodoma	43,727	48,282	52,682	71,601	76,159	81,103	86,728	92,138	97,230	102,535	108,063	113,824	119,827	126,083	161,537	205,113
Iringa	63,101	66,417	73,610	78,961	84,447	88,149	92,311	96,843	101,786	106,937	112,304	117,897	123,725	129,798	164,220	206,527
Kigoma	8,008	9,205	10,273	11,298	12,352	13,439	14,162	14,938	15,773	16,643	17,550	18,495	19,479	20,505	26,320	33,467
Kilwa Masoko	1,704	2,617	3,378	3,588	3,813	4,054	4,317	4,587	4,865	5,154	5,456	5,770	6,098	6,439	8,374	10,753
Lindi	8,030	9,252	10,337	10,875	11,446	12,051	12,738	13,475	14,267	15,093	15,953	16,850	17,784	18,757	24,274	31,055
Mafia	3,963	4,966	5,823	6,116	6,426	6,754	7,135	7,550	8,003	8,476	8,968	9,481	10,015	10,572	13,729	17,609
Mbeya	83,906	88,089	94,057	100,754	109,681	115,459	120,954	126,948	133,499	140,325	147,438	154,850	162,574	170,623	216,240	272,308
Mtwara	14,108	15,489	16,750	17,448	18,176	18,935	19,878	20,960	22,201	23,495	24,843	26,248	27,711	29,236	37,881	48,506
Musoma	28,971	30,951	38,094	44,774	56,242	60,061	68,836	73,779	76,617	79,575	82,656	85,867	89,213	92,700	112,463	136,753
Mwanza	104,822	110,425	129,732	141,345	153,262	163,345	171,539	180,187	189,323	198,844	208,764	219,102	229,874	241,099	304,721	382,918
Shinyanga	141,809	148,392	168,153	181,420	195,035	207,543	217,271	227,409	237,973	248,981	260,452	272,406	284,862	297,841	371,408	461,827
Singida	13,222	14,588	15,829	16,511	17,223	17,968	18,882	19,921	21,104	22,337	23,621	24,960	26,354	27,808	36,045	46,169
Songea	10,711	12,027	14,739	16,904	19,104	20,028	21,064	22,179	23,381	24,633	25,938	27,298	28,716	30,192	38,563	48,851
Sumbawanga	9,219	10,411	11,469	11,956	18,423	24,914	26,102	27,409	28,850	30,351	31,916	33,546	35,245	37,015	47,048	59,379
Tabora	52,555	55,369	60,632	65,807	71,089	74,548	77,964	81,640	85,603	89,732	94,035	98,519	103,192	108,061	135,657	169,574
Coastal & Northern	1,562,163	1,695,140	1,858,482	2,020,026	2,521,768	2,786,192	3,292,701	3,576,338	3,722,903	3,875,628	4,034,771	4,200,604	4,373,411	4,553,486	5,574,110	6,828,539
Grid System	2,202,809	2,273,510	2,605,442	2,843,997	3,417,050	3,736,636	4,299,530	4,637,404	4,838,065	5,047,158	5,265,039	5,492,081	5,728,669	5,975,208	7,372,534	9,089,960
Total Country	2,275,063	2,356,822	2,682,091	2,925,270	3,509,593	3,839,041	4,405,292	4,747,679	4,954,356	5,169,719	5,394,133	5,627,981	5,871,663	6,125,594	7,564,816	9,333,735
Isolated Centres	72,254	83,312	76,649	81,273	92,543	102,405	105,762	110,275	116,291	122,561	129,093	135,901	142,994	150,386	192,282	243,775

Notes: Economic Scenario: A - Moderate GDP Growth. Industrial Development Sequence: 2 - High Growth. Customer Development Scenario: A - Moderate Recovery. Short Term Period: (2006-2011). A 3 Year Short-Term to Long-Term Transition Period in General Use Sales
Source: Power Master Plan 2003 update

PROJECT MODIFICATIONS

The following Design and Supply Modifications were implemented.

1. **Component (iii)** - Construction of 220/66/33/11 kV substation at Babati, construction of 66/33/11 kV substation at Kondoa, construction of 66/33 kV substations at Mbulu and Karatu:
 - a. The power transformers installed are three winding ones, the tertiary voltage being 11kV which is used to feed 11kV local lines and thus saving the 33k/11kV substations previewed in component 5;
 - b. The ratings of the power transformers used and a second forced-air cooling stage added. The new ratings are, respectively, 20/26/33 MVA for 220/66/11 kV and 5/6.6/8.4 MVA for 66 kV;
 - c. A third 66/33/11kV substation was constructed at Kondoa, complete with control, operation and protection equipment as well as PLCC link to Babati. The Kondoa substation was provided 2x5/6.6/8.4 MVA, 66/33/11 kV power transformers. The substation was necessitated by the decision to supply power to Kondoa through a 66kV line rather than a 33kV line in order to allow for future expansion in the surrounding area.

2. **Component (iv)**- Overhead lines:
 - a. 85 km 66 kV single circuit line was constructed between Babati substation and the new 66/33/11 kV Kondoa substation instead of the corresponding 33kV Babati line?
 - b. The 66 kV lines were constructed on self supporting steel towers over their entire length, as the wooden poles were not suitable for use the type of terrain where the lines were to be routed; the total number of connected to 3 phase lines was reduced to 640.

3. **Component (v)** - Construction of Distribution substations
The 2.5 MVA 33/11 kV substations were not constructed, instead the 11kV supply was brought from the 11 kV tertiary windings of the 5/6.6/8.4 MVA, 66/33/11 kV power transformers that had been installed at Babati and Kondoa substations.

4. **Component (vi)** -Rehabilitation of Moshi and Arusha Distribution
 - a. Extension of overhead lines – from 168km to 195 km;
 - b. Number of new stations – from 70 to 127

5. **Component (vii)** - Supply of Tools and Equipment
A number of modifications were made.

SUPPLY OF TOOL AND EQUIPMENT

Spec. No.	Description	Quantity
3501	Safety belt	25
3502	Safety strap	25
3503	Lines man tool bag	25
3504	Safety helmet	35
3505	Safety boots	60
3510	Retractable hook switch	10
3511	Short circuit earthing kit	10
3512	Earth tester	5
3513	Voltage detector (wind mill type)	6
3514	Phase sequence tester	6

PROJECT MODIFICATIONS

Spec. No.	Description	Quantity
3515	Multimeter	6
3516	Megaohmmeter 5kV	6
3520	Screw driver 'flat'	15
3521	Screw driver 'star'	15
3522	Adjustable spanner	15
3523	Open end(fixed) spanner	15
3524	Box end(ring) spanner	15
3525	Combination spanner	15
3526	Locking pliers	15
3527	Hacksaw	15
3528	Hacksaw replacement blades	400
3529	Double face hammer 'linesman'	10
3530	Sledge hammer (6.4 kg)	10
3531	Auger M-16	50
3532	Auger M-20	50
3533	Tool Box	6
3534	Manual punch	6
3540	Electrical tool box	6
3550	Electric hand drill	6
3560	Tensioning hoist 3 tons	20
3561	Tensioning hoist 1/12 tons	25
3562	Tensioning hoist 'jaw type'3 tons	6
3563	Camelong for 25mm ² to 100 mm ² conductor	25
3564	Camelong for 50mm ² to 150 mm ² conductor	20
3565	Stringing block pulley	200
3566	Drum jack	10
3567	Hand operated hydraulic compression tool c/w dies	10
3568	Wire cutters for up to 150 mm ² conductor	10
3569	Wire cutters for up to 50 mm ² conductor	10
3570	Climber for round poles	15
3571	Extension ladder	15
3580	Computer, printer and UPS	3
3581	Type writer (electric)	4
3582	Photocopier	1
3583	Desk calculator	4
3584	Scientific calculator	6
3585	Multi plug extension	10
3586	Extension cord	10

6. Component (viii) - Vehicles

The number of truck was increased from 2 to 4

7. Component (ix) - Training of staff.

The man months for training were reduced from 24 to 10.

ACTUAL COST AND FINANCING OF PROJECT BY CATEGORY/COMPONENTS

(SUMMARY OF PROJECT COST (ADF/NTF/DANIDA/ADF/GOT) BY COMPONENT (IN UA MILLION))

Component/Source		ADF	NTF	DANIDA	NDF	GOT	TOTAL
		Actual	Actual	Actual	Actual	Actual	Actual
PHASE I							
Construction of 230 kV line and Upgrading of 220kV Substation	A&B			38.708			38.708
Construction of 220/66/33/11 Substations	C	9.178				0.338	9.516
Construction of 66/33/11/LV lines	D	8.953	2.099			2.238	13.290
Construction of distribution substations	E	1.370	0.349				1.719
Rehabilitation of Distribution Systems	F				3.987		3.987
Supply of tools and equipment	G		0.143				0.143
Supply of vehicles	H		0.212				0.212
Training of staff	I						
Engineering design and supervision	J	0.508	0.947				1.455
SUB-TOTAL		20.009	3.750	38.708	3.987	2.576	69.030
PHASE II							
Construction of 275 km of 33 kV lines later on revised to 300 km of 33 kV lines;	1	0.696	0.052			0.479	1.227
Construction of 44 km of low voltage lines later on revised to 49 km of low voltage;	2	0.184	0.014			0.127	0.325
Construction and installation of 52 distribution transformers;	3	0.068	0.037			0.004	0.109
Construction and installation of 525 service lines and meters later on revised to 600	4	0.050	0.004			0.034	0.088
Installation of 75 street lights;	5	0.004					0.004
Supply of tools and equipment;	6						
Supply of vehicles	7		0.104				0.104
Engineering and project management	8		0.543			0.121	0.664
SUB-TOTAL		1.002	0.754			0.765	2.521
GRAND TOTAL		21.011	4.504	38.708	3.987	3.341	71.551

Source: TANESCO ADB PCR Mission

YEARLY ADB DISBURSEMENT TIME PROFILE**(DISBURSEMENT PROFILE AT APPRAISAL COMPARED WITH ACTUAL)**

Year	ADF				NTF				TOTAL (ADF+NTF)			
	As at Appraisal		Actual		As at Appraisal		Actual		As at Appraisal		Actual	
	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)
1992					1.236	20.60			1.236	4.26		
1993	4.941	21.46			0.903	15.05			5.844	20.13		
1994	9.106	39.55			1.67	27.83			10.776	37.13		
1995	7.712	33.49		-	1.639	27.32	0.260	5.77	9.351	32.22	0.26	1.02
1996	1.267	5.50	0.112	0.53	0.552	9.20	0.076	1.69	1.819	6.27	0.188	0.74
1997			0.102	0.49				-			0.102	0.40
1998			7.289	34.69			0.662	14.70			7.951	31.16
1999			8.034	38.24			1.532	34.01			9.566	37.49
2000			4.103	19.53			1.033	22.94			5.136	20.13
2001			0.369	1.76			0.124	2.75			0.493	1.93
2002							0.210	4.66			0.21	0.82
2003							0.302	6.71			0.302	1.18
2004			0.667	3.17			0.284	6.31			0.951	3.73
2005			0.335	1.59			0.021	0.47			0.356	1.40
2006												
	23.026	100	21.011	100	6	100	4.504	100	29.026	100	25.515	100

Source: ADB PCR Mission compilation

INSTITUTIONAL PERFORMANCE AND IMPACT

1 The Executing Agency (EA) at appraisal was MEM while TANESCO, which has been responsible for all the power infrastructure projects financed by GOT and donors in Tanzania, was the Implementing Agency. Both the EA and PIU were effective in carrying out their responsibilities in the implementation of the project.

The Electric Power Sector Reforms

2 The Tanzanian Government policy of liberalisation and privatisation has been touted for the over ten years, during which a unit was established within the Company, entrusted with coordination of privatisation and related activities. The reforms that were undertaken by the Government spanned the entire period of project implementation. However, these have not impacted negatively on the implementation and outcomes of the project, but rather on TANESCO itself.

3 A major component of the reforms is unbundling of TANESCO into the generation, transmission and distribution sub-systems. The concept of liberalisation and privatisation of public utilities, which was internationally driven, appears not to have been sufficiently digested and more importantly owned by the Government. For example, a distinction has not been drawn between privatisation (the divestiture of ownership to the private sector) and the issue of reforms as means of ensuring efficiency of operation of the organisation vis-à-vis the sector as a whole. The Government has 100% ownership of TANESCO but notwithstanding the ownership, the Company could still be made more efficient than it is at the moment.

4 The management of the Company was outsourced to the Net Group Solutions Pty of South Africa for a period of four years to turn around and prepare the Company for privatisation. The management contractor however failed in achieving the set objectives and indeed created some of the current problems of TANESCO such as the problematic accounting and billing software, which were selected or procured but did not meet the needs of the Company. It is to be noted the privatisation process also slowed down investment in the Company, recruitment was frozen and the training centres closed down. The latter had created a vacuum in the operations of the Company with shortage of artisans and technicians while the engineering capabilities were not continually updated. The contract ended in December 2006 and notice was given that it will not be renewed. Following the failure of the management contractor to turn TANESCO around, the Company is in need of further reform to strengthen its management capability and financial situation in order to assure its going concern basis.

5 The sector reform already commenced by the Government needs to be sustained and necessary machinery set in motion in pursuance of the policy goal. The reform should address the issue of management and financial restructuring, and internal capacity building as against the outsourcing to a management contractor. Increased investment in the sector could only be achieved through opening up of the sector to competition. There is now a regulatory framework in place with the establishment of the Energy and Water Utilities Regulatory Authority (EWURA) meant to regulate the operations of TANESCO and other players including Independent Power Producers (IPP). The entry of the IPPs is a welcome development especially in this time of electricity supply crisis and a manifestation of private sector participation in energy sector investment. However, most of the IPPs have come in at a time when Tanzania has been going through an energy crisis requiring emergency action by the Government. They are, therefore, coming in under conditions that are most favourable to them exerting pressure on TANESCO. This has actually worsened the situation of the latter.

INSTITUTIONAL PERFORMANCE AND IMPACT

6 The Government is still not explicit on the direction it wants to take regarding the unbundling of TANESCO. The recommendation for the phased unbundling of TANESCO into Generation, Transmission, Distribution and Support Services was approved by the Board. The committee on privatisation visited other countries to share their experience on the process and came to the conclusion that, because of the relatively small size of the power system in the country, privatisation was not appropriate at that time. The Government therefore suspended the privatisation programme as well as the unbundling process of the Company, as per Government Notice No. 373 published on 18th November 2005. The issue of electricity sub-sector reforms, including liberalisation, in Tanzania and indeed other African countries is a complex one, requiring further studies and evaluation to come up with approaches best suited to conditions obtaining in these countries.

Tariff Policy and Structure

8 The current tariff is around US\$ 0.08 / kWh well below the level of the 1985 level of twelve United States cents per Kilowatt-hour (US\$ 0.12 / kWh). There is a raging debate on the kind of tariff that will be the most suitable for the current situation in the country. Of course there is need to ensure sustainability of the operations of TANESCO and availability of funds for the operations and maintenance, and future investment in the infrastructure. Urgent actions need to be taken to address this issue. As a first step, the tariff studies that have been done should be updated and made as comprehensive as possible to provide a basis and rationale for any future increases. The tariff arrived at should balance the requirement for affordable price on the one hand, and reasonable return on investment to the service provider to stimulate growth and competitiveness, on the other.

9 This could largely be achieved by the use of discriminatory tariffs imposed on different segments of the consumers. In the meantime, TANESCO should focus on higher sales to industrial and commercial consumers while ensuring full and prompt recovery of amounts billed.

Accounting and Budgeting

10 TANESCO uses three software packages namely *iScala* accounting package for the general ledger, sales, purchases, fixed assets accounting including fixed assets register, inventories, cashbook and payroll; *Custima* application for billings; and *Actaris* for prepaid meters. The three packages were not integrated thus leaving a gap to be filled via manual processes. The accounting and billing packages were sluggish while the inventories package included in the system never functioned resulting in improper accounting for stocks. In absence of support from the vendors, Scala South Africa Pty Limited, there were occasional system breakdown resulting in arrears of data entry. The consultants have been invited to assist in resolving the software problems. The problems of accounting system should be addressed headlong. The technical support from the software vendors should only be a temporary solution in getting the accounting system working to clear the backlog of data entry and processing to generate the required financial information. The billing software problems should also be solved as a short term measure. In the long term, integrated and well tested accounting and management information systems should be acquired for the unbundled units.

11 Although the figures in the management accounts were un-audited, the early production was clear indication that the Finance Department was capable of providing prompt financial information to enable management and board take timely decisions. It was noted that the Finance Department was able to generate the required accounting and management information report in good time despite the reported sluggishness of the software. As an example, at the time of review on 7th December 2006, the management accounts for the third quarter ended 30th September 2006 and the monthly report for October 2006 were already prepared.

INSTITUTIONAL PERFORMANCE AND IMPACT

12 The budgeting and budgetary control system was also functional with annual budgets prepared and used for controlling expenditure. The budgeting process was independent of the software and the budget was constantly updated as may be required. The Finance Department was also responsible for the long term financial planning by the preparation of financial projections, which were incorporated into the Corporate (Business) Plan prepared/coordinated by the Corporate Planning and Research Department.

Auditing

13 As stated in paragraph 3.4.3, the project audit report and accounts, which were submitted, did not meet loan conditions. The separate audited accounts of the ADF and NTF loans for year ended 31st December 2004 specifically focused on the respective loans and were not consolidated. Furthermore, a full picture of the state of affairs of the whole project covering the loan funds and Borrower's contributions could, therefore, not be obtained.

14 The audits of TANESCO annual accounts were done on a regular basis. The latest audited accounts for the year ended 31st December 2005 was being finalized as at the time of the PCR mission in December 2006. The delayed finalization of audits contravenes the provisions of the Companies law, which requires the company to file its annual accounts and returns within the within nine months of the accounting date, and the oversight requirements for submission of duly audited accounts to the supervising ministry within a similar period after the expiry of each fiscal year. In the meantime, it was observed that the accounts have been intermittently qualified, based upon anomalies in the accounts specifically non-update of the records of inventories, non-reconciliation of debtors and creditors balances and above all doubts over the going concern basis of the Company. The software problems, earlier discussed (paragraph 10 above) was responsible for the non-update of the record of inventories and other accounting problems. Unless urgent decisions are taken and followed up with concrete actions, there could be a complete breakdown of the accounting and management information system.

Billings and Collection

15 The concern expressed during appraisal on the need for effective billing and collection policy and procedures remains. One of the unfulfilled loan conditions relate to reduction of Accounts receivable to a level of not more than 2 months of Sales by 31st July 1994. Although the levels have been fluctuating, total Accounts Receivable stood at of Tsh 209.65 billion as at the end of 2006, almost 12 months of Sales. Of this amount only 8.40% was due from Industrial and Commercial consumers while 84.66% was due from Private Individual consumers. Government Departments and Ministries owed approximately 0.92% while Parastatals owed 4.88%. The age analysis shows a common pattern among all categories of consumers implying that energy sales volume as well are along similar pattern. 82.88% was over 120 days old, while only 6.75% was within the 30 days bracket. **Annex 8** shows the trends over the period.

16 Part of the project objectives was to increase sales of electricity to the Industrial and Commercial consumers. The statistics however show that bulk of the sales still go to the private consumer rising from 75 % at appraisal to 85% at PCR. Since energy supply is key to economic and industrial development, TANESCO should focus on higher sales to that segment while ensuring full and prompt recovery of amounts billed. Sales value could be increased further by adjusting the tariff structure to reduce cross subsidy to Industrial and Commercial consumers. Efforts should be made by TANESCO to clean up, from its Accounts Receivable, non-collectible amounts arising out of ineffective meter reading, demolished buildings, removed meters, etc. Collections should be more vigorously pursued with disconnection and other appropriate actions. TANESCO has already constituted a task force for this purpose. Effective actions on receivables and cleaning out of bad accounts should be a condition for future Bank intervention.

CONSUMER STATISTICS 1990-2006

CONSUMER POPULATION

Tariff Band	Consumer Category	1990	1995	2000	2001	2002	2003	2004	2005
D1	Domestic Low Usage								
1	General Usage	154,617	n/a	n/a	451,190	470,969	524,783	546,755	588,512
2	Low Voltage Supply (max. Demand Usage)	548	n/a	n/a	1,069	1,192	1,294	1,265	1,286
3	High Voltage Supply (Max. Demand Usage)	119	n/a	n/a	153	166	193	188	222
4	Zanziba Supply Bulk		n/a	n/a	1	1	1	1	1
5	Company Usage		n/a	n/a	204	305	323	277	264
	Total	155,284	-	-	452,617	472,633	526,594	548,486	590,285
	Growth				191.48	4.42	11.42	4.16	7.62

SALES BY TARIFF BAND (IN GWh) -Audited

Tariff Band	Consumer Category	1990	1995	2000	2001	2002	2003	2004	2005
D1	Domestic Low Usage	n/a	n/a					212	374
1	General Usage	n/a	n/a	1,024.8	1,064.0	1,108	1,061	873	771
2	Low Voltage Supply (max. Demand Usage)	n/a	n/a	309.0	291.0	294	337	378	392
3	High Voltage Supply (Max. Demand Usage)	n/a	n/a	389.8	441.0	522	641	684	750
4	Public Lighting	n/a	n/a	1.0					
5	Zanzibar	n/a	n/a	132.1	127.0	133	145	161	186
6	Resolute Gold Mine	n/a	n/a		29.0	33	43	44	45
7	Kahama Mine	n/a	n/a		79.0	96	99	114	110
	Total			1,857	2,031	2,186	2,326	2,466	2,628

CONSUMER STATISTICS 1990-2006

SALES BY TARIFF BAND (IN TSHS MILLION)(Audited)

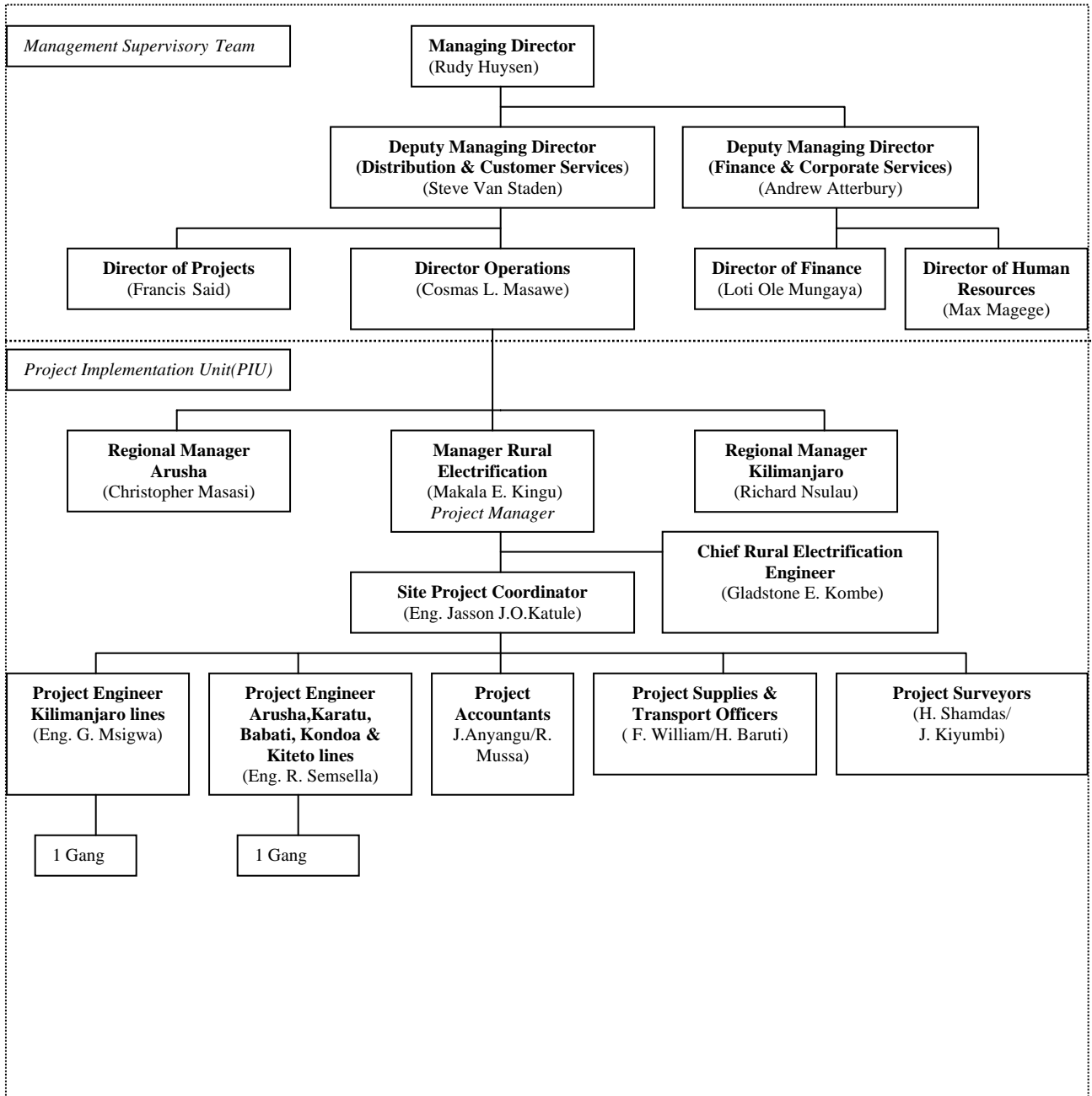
Tariff Band	Consumer Category	1990	1995	2000	2001	2002	2003	2004	2005
D1	Domestic Low Usage	n/a	n/a					18,743	32,606
1	General Usage	n/a	n/a	61,252	59,049	69,002	74,499	69,126	72,881
2	Low Voltage Supply (max. Demand Usage)	n/a	n/a	31,724	30,264	27,099	28,745	32,770	36,654
3	High Voltage Supply (Max. Demand Usage)	n/a	n/a	34,049	39,084	40,952	46,909	50,624	61,029
4	Public Lighting	n/a	n/a	31					
5	Zanzibar	n/a	n/a	3,696	3,676	3,953	4,256	4,910	6,038
6	Resolute Gold Mine	n/a	n/a		2,016	2,237	2,861	2,929	2,978
7	Kahama Mine	n/a	n/a		5,120	6,772	7,744	9,373	
	Total	-	-	130,752	139,209	150,015	165,014	188,475	212,186

ACCOUNTS RECEIVABLE (Tshs million)

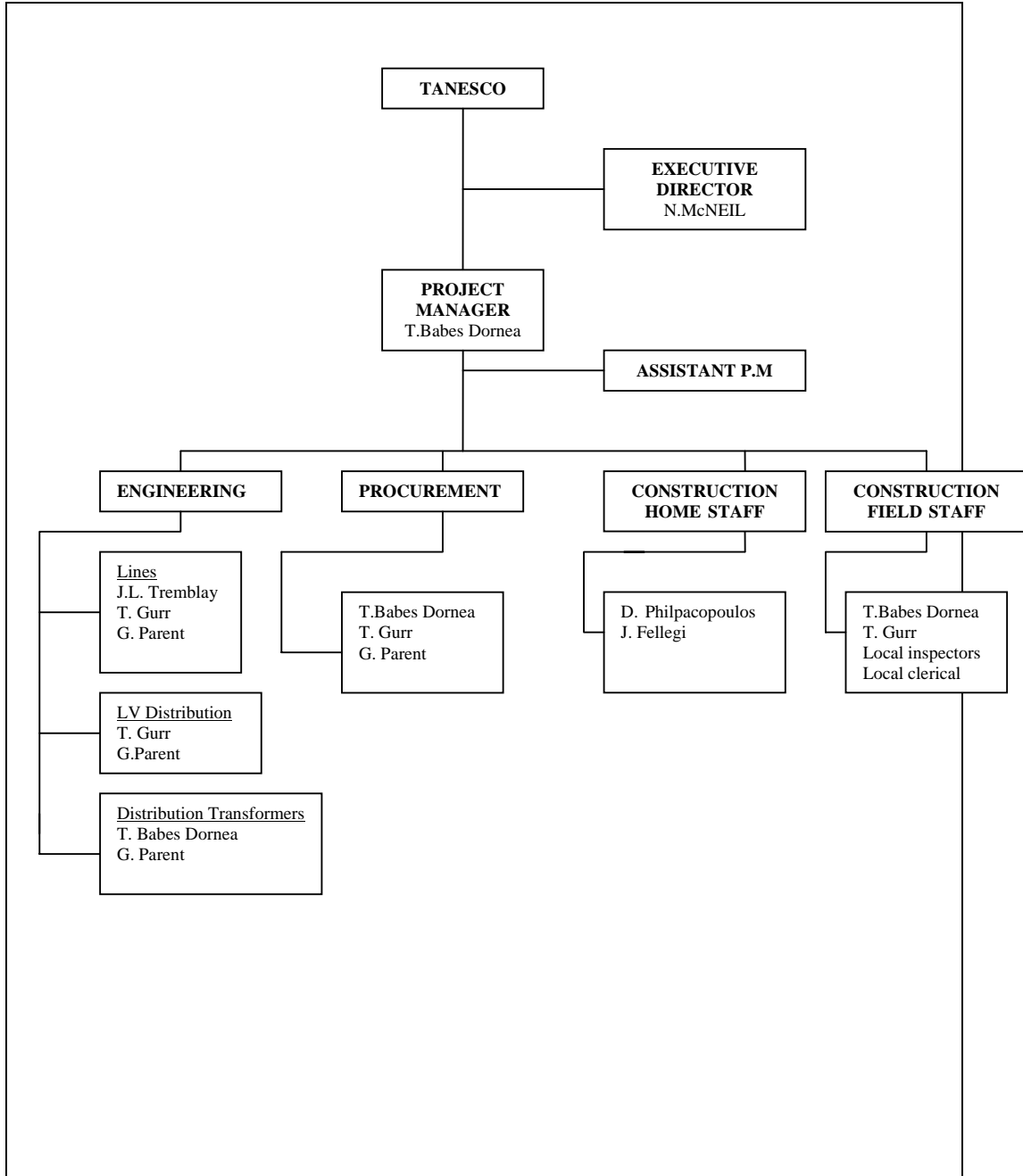
Consumer Category	1991	1995	2000	2001	2002	2003	2004	2005	2006
Private	1767.3	n/a	121,638.4 0	110,071.90	141,557.60	117,216.70	153,154.00	151,570.70	181,221.40
Industrial & Commercial	258.5	n/a	18,760.40	15,240.20	15,632.80	14,411.10	20,247.50	12,286.10	11,969.90
Water Supply	484.4	n/a	6,346.70	8,199.90	25,992.60	4,828.90	2,909.40	2,422.40	2,772.30
Parastatals	794.6	n/a	15,286.90	8,703.40	8,317.30	7,690.50	6,876.70	5,506.20	4,755.40
Zanzibar	873.5	n/a	14,350.00	17,230.30	19,409.00	19,710.20	19,761.00	20,422.60	871.30
Government	237.1	n/a	30,282.10	33,420.50	20,415.20	2,571.70	3,540.40	5,256.70	7,638.80
Embassies	135.3	n/a	1,275.40	1,291.70	1,136.40	1,031.50	1,084.30	531.80	416.10
Miscellaneous **	855								
Total	5,405.70	-	207,939.9 0	194,157.90	232,460.90	167,460.60	207,573.30	197,996.50	209,645.20

n/a = not available

ORGANIZATION CHARTS
(TANESCO PROJECT ORGANIZATION CHART)



ORGANIZATION CHART
(TECSULT PROJECT ORGANIZATION CHART)



CALCULATION OF FINANCIAL RATE OF RETURN
(RETROSPECTIVE FINANCIAL INTERNAL RATE OF RETURN (Tsh millions)
INCLUDING DANIDA AND NDF COMPONENTS)

Year	Investment ADB Package	DANIDA +NDF Package	Expenses + O&M	Total Cost	Sales Revenue	Savings from Diesel	Total Benefits	Net Benefits
1995	1,727	22,817		24,543			-	(24,543)
1996	1,675	30,422		32,097			-	(32,097)
1997	1,518	25,167		26,685			-	(26,685)
1998	7,934	3,134		11,067			-	(11,067)
1999	11,172	2,350		13,522			-	(13,522)
2000	3,066		14,910	17,976	18,305	2,951	21,256	3,281
2001	962		14,907	15,869	19,489	770	20,260	4,391
2002	708		19,423	20,132	21,002	770	21,772	1,641
2003	805		26,596	27,400	23,102	770	23,872	(3,528)
2004	1,631		31,497	33,128	26,387	770	27,157	(5,971)
2005	574		38,671	39,245	31,032	770	31,802	(7,442)
2006			40,604	40,604	34,135	770	34,906	(5,699)
2007			42,635	42,635	37,549	770	38,319	(4,315)
2008			44,766	44,766	41,304	770	42,074	(2,692)
2009			47,005	47,005	45,434	770	46,204	(800)
2010			49,355	49,355	49,978	770	50,748	1,393
2011			51,823	51,823	54,975	770	55,746	3,923
2012			54,414	54,414	60,473	770	61,243	6,829
2013			57,135	57,135	66,520	770	67,290	10,156
2014			59,991	59,991	73,172	770	73,942	13,951
2015			62,991	62,991	80,489	770	81,260	18,269
2016			66,140	66,140	88,538	770	89,309	23,168
2017			69,447	69,447	97,392	770	98,162	28,715
2018			72,920	72,920	107,131	770	107,902	34,982
2019			76,566	76,566	117,844	770	118,615	42,049
2020			80,394	80,394	129,629	770	130,399	50,005
2021			92,453	92,453	142,592	770	143,362	50,909
					FIRR	4.09%		
					FIRR 10% increase in revenue	6.75%		
					FIRR 10% increase in overhead & maintenance costs	1.28%		

CALCULATION OF ECONOMIC RATE OF RETURN**(RETROSPECTIVE ECONOMIC INTERNAL RATE OF RETURN****(Tsh millions)****INCLUDING DANIDA AND NDF COMPONENTS)**

Year	Investment ADB Package	DANIDA +NDF Package	Expenses + O&M	Total Cost	Sales Revenue	Savings from Diesel	Private Plants Savings	Total Benefits	Net Benefits
1995	1,468	20,535		22,003				-	(22,003)
1996	1,423	27,380		28,803				-	(28,803)
1997	1,291	22,650		23,941				-	(23,941)
1998	6,744	2,820		9,564				-	(9,564)
1999	9,496	2,115		11,611				-	(11,611)
2000	2,606		14,910	17,516	18,305	2,951	2,893	24,150	6,634
2001	817		14,907	15,725	19,489	770	2,893	23,153	7,429
2002	602		19,423	20,026	21,002	770	2,893	24,666	4,640
2003	684		26,596	27,280	23,102	770	2,893	26,766	(514)
2004	1,386		31,497	32,883	26,387	770	2,893	30,050	(2,833)
2005	488		38,671	39,159	31,032	770	2,893	34,696	(4,463)
2006			40,604	40,604	34,135	770	2,893	37,799	(2,805)
2007			42,635	42,635	37,549	770	2,893	41,213	(1,422)
2008			44,766	44,766	41,304	770	2,893	44,968	201
2009			47,005	47,005	45,434	770	2,893	49,098	2,093
2010			49,355	49,355	49,978	770	2,893	53,641	4,286
2011			51,823	51,823	54,975	770	2,893	58,639	6,816
2012			54,414	54,414	60,473	770	2,893	64,137	9,723
2013			57,135	57,135	66,520	770	2,893	70,184	13,049
2014			59,991	59,991	73,172	770	2,893	76,836	16,845
2015			62,991	62,991	80,489	770	2,893	84,153	21,162
2016			66,140	66,140	88,538	770	2,893	92,202	26,062
2017			69,447	69,447	97,392	770	2,893	101,056	31,608
2018			72,920	72,920	107,131	770	2,893	110,795	37,875
2019			76,566	76,566	117,844	770	2,893	121,508	44,942
2020			80,394	80,394	129,629	770	2,893	133,293	52,899
2021			92,453	92,453	142,592	770	2,893	146,256	53,802
					EIRR		6.39%		
							8.95%		
							3.66%		

SUMMARY ASSUMPTIONS FOR ECONOMIC AND FINANCIAL ANALYSIS

Financial and Economic Analysis and Rates of Return Calculation

1. The retrospective EIRR of the investment is computed based on the streams of incremental costs and benefits **Annex 10**.
2. The computation has been done under the scenario recognizing that the DANIDA investment is critical to the achievement of the overall project objective. The Bank Group component could not have started without the DANIDA package being implemented to provide the basis for the former. At appraisal, the project economic justification was evaluated based on three scenarios two of which exclude costs of the DANIDA and NDF components. The argument for the exclusion of the DANIDA investment was that because the package is the 220kV Transmission line extending over 316 km from Singida to Babati and Arusha, which will serve as the backbone from which extensions will be made over the years to meet future demand along the line, hence the full cost should not be charged to the project. Even then all the foreseeable financial benefits were not accounted for in the calculation because the long term effects on the overall transmission system could not be quantified as they will be spread all over the Grid system. For example, the provision of the 220kV transmission Line would help to improve the reliability of supply on the existing 132 kV line running from Hale (north-east region) via Same to Moshi and Arusha. The existing 132 kV line were only line supplying Moshi and Arusha and these towns were experiencing frequent outages and load shedding.
3. TANESCO was operating two diesel generators, one in Babati and the other in Kondoia which provided GWh 3.15. The rest of the areas for which the 66kV, 11kV and 0.4Kv are to be provided have either no electricity or supplied through privately owned diesel generators. There were about 57 of those for a capacity of about 4250 kW, which were assumed to increase to about 100 for a total capacity of 7000kW by project completion. Benefits accruing to TANESCO on savings from diesel are retained in the FIRR computation as projected at appraisal while the benefits accruing from the displacement of the privately owned generators are captured in the calculation of the EIRR.
4. The appraisal analysis was conducted using 1991 prices, assuming implementation would commence in January 1992 and would last for 48 months period to be completed in December 1995. The calculation of internal rates of return was therefore based upon projections for 30 year from 1992 to 2021.
5. At PCR, the economic analysis was conducted by converting the financial costs into economic terms by applying relevant conversion factors applicable in Tanzania. The actual construction, supervision and maintenance economic costs as well as the benefits mentioned above emanating from the revised forecasts formed the basis for re-evaluation of EIRR.
6. This EIRR was lower than the opportunity cost of capital of 11% in Tanzania, because most of the benefits expected to contribute have not been captured.
7. The project has created economic benefits for the country especially the benefiting regions (Arusha and Kilimanjaro) in northern Tanzania with enormous agricultural, agro-industrial and tourism activities accounting for about 70% of the country's wheat production mainly from Arusha. The National Agricultural Food Corporation (NAFCO) accounts for about 60% of the production while the remaining come from smallholder farmers. The Government is committed to encouraging the small holders to improve their yields by the provision of fertilizers and some level of mechanization. The provision of electricity also facilitated the establishment of repairs workshops and flour mills, catering for the needs of the rural and semi-urban areas with long term benefits to the population in the hinterland thus facilitating the establishment of growth centres to ultimately curtail the urban rural drift.

SUMMARY ASSUMPTIONS FOR ECONOMIC AND FINANCIAL ANALYSIS

8. The foreign exchange earnings expected to be generated from tourism to which the project had contributed were not estimated at appraisal. The project area is well known for tourism with several attractions including the famous Ngorongoro crater and the Serengeti National Park, and centres for holding of conferences including the seat of the East African Community (EAC) among others. A number of hotels and lodges in this region were using diesel generators for power supply with the high cost. There is a high Government commitment to accelerate tourism development and the project has facilitated the realization of the commitment. Because tourism development is an indirect benefit, as well as a joint benefit among several sectors, part of the benefit from tourism could be attributed to the project.
9. Among the potential beneficiaries is a phosphate plant, which currently depends on its own diesel-fired plant. Connection to the grid will yield major savings in fuel cost, improve its productivity, profitability and result in more employment and increased income.
10. The project has also facilitated the interconnection between Tanzania and Kenya. At the time of project formulation, this issue was under discussion. Subsequently, an agreement has been reached for an interconnection between Arusha in Tanzania and Nairobi, Kenya, as part of the trade in energy electricity interconnection in the sub-region which will soon be implemented.
11. The contribution of the project to the social development of the region is significant especially relieving women and children of the long hours spent in the search of firewood and water. More families within the community will convert from the use of firewood for cooking while availability of electricity will facilitate water supply operations.
12. The analysis does not fully capture a number of important benefits because:
 - i) data was not available to enable all the new major industries, agricultural and tourism enterprises that have come up in the region have been reflected;
 - ii) the productivity of these industries and enterprises which has no doubt stimulated growth and economic activity leading to enhanced employment and income generation;
 - iii) data is not readily available on the fast growing informal sector and its impact on income as well as employment generation; and
 - iv) it is difficult to quantify the full level of social benefits e.g. education, provision of water services.

Summary Analysis of Historical Financial Statements of TANESCO

13. The facts on the ground suggest that the Company is technically insolvent. The liquidity ratio averaged 0.06 over the last eight years while the Current Ratio averaged 0.31. This demonstrates clearly that the Company was under intense financial pressure most of the time. Sales over the last eight years grew at an average rate of 10.22 % annually with the highest rate of 17.61% obtained in 2005. TANESCO has not been able to cover its costs with Operating costs being in excess of income over the last three years reaching 124.62% in 2005 and averaging 97.23% in the last eight years resulting in losses over the period. Total Assets remain substantially stagnant with a average annual growth of 1.16% while Return on Total Assets has been negative on the average over the period. Growth in Equity on the other hand averaged 22.32% apparently as a result of the conversion of Government Loan to Equity in 2005 but which was being wiped off by accumulated losses.

SUMMARY ASSUMPTIONS FOR ECONOMIC AND FINANCIAL ANALYSIS

14. The financial situation of TANESCO was beginning to affect the operation of its power system. Apparently many of the problems such as non replacement of defective parts or equipment that have been reported but not acted on may be traced to the Company's tight financial situation. Further capital restructuring of the Company should be undertaken immediately as part of a long term strategy to address the financial problems of the Company and ensure its going concern. The summary historical financial statements and ratio are given below.

Table 1: TANESCO - Historical Financial Statements 1999 - 2005

INCOME STATEMENT	2005	2004	2003	2002	2001	2000	1999
Sales	221,658	188,475	165,014	150,015	139,209	130,752	124,199
Cost of sales	276,221	224,978	189,968	138,739	106,480	127,065	68,777
Gross Profit / (loss)	-54,563	-36,503	-24,954	11,276	32,729	3,687	55,422
Other income	78,612	88,104	37,957	24,975	5,820	5,149	1,819
Operating expenses	49,063	87,055	78,268	37,205	62,081	78,296	40,384
Operating loss	-25,014	-35,454	-65,265	-954	-23,532	-69,460	16,857
Net finance income/(expense)	73,646	-77,969	-157,089	-120,747	-59,989	15,648	-41,425
Profit/(loss) before tax	48,632	-113,423	-222,354	-121,701	-83,521	-53,812	-24,568
Income tax (charge)/credit	-24,590	53,152	45,556	51,157	90,997	-7,894	-508
Profit/(loss) after tax	24,042	-60,271	-176,798	-70,544	7,476	-61,706	-25,076
BALANCE SHEET	2005	2004	2003	2002	2001	2000	1999
Non-current assets	1,181,114	1,198,521	1,213,417	1,227,753	1,241,460	1,233,455	1,235,972
Current assets	154,717	149,808	149,202	154,970	142,772	139,101	197,454
Total assets	1,335,831	1,348,329	1,362,619	1,382,723	1,384,232	1,372,556	1,433,426
Total equity	1,176,839	402,720	449,718	575,786	666,645	665,518	760,393
Non-current liabilities	49,183	389,165	403,360	446,869	457,606	496,708	520,096
Total liabilities	158,992	945,609	912,901	806,937	723,811	707,038	673,033
Total equity and liabilities	1,335,831	1,348,329	1,362,619	1,382,723	1,390,456	1,372,556	1,433,426
Liquidity Ratio	0.16	0.02	0.03	0.06	0.02	0.06	0.09
Current Ratio	0.97	0.16	0.16	0.19	0.20	0.20	0.29
Asset Growth	0.93	1.05	1.45	0.11	(0.85)	4.25	
Growth in Equity	192.22	(10.45)	(21.89)	(13.63)	0.17	(12.48)	
Operating Ratio (%)	124.62	119.37	115.12	92.48	76.49	97.18	55.38
Return on Asset (%)	1.80	(4.47)	(12.97)	(5.10)	0.54	(4.50)	(1.75)
Sales Growth (%)	17.61	14.22	10.00	7.76	6.47	5.28	

**PROJECTED INVESTMENT REQUIREMENTS IN THE POWER SECTOR
(US\$ MILLION)**

Year	Generation Facilities	Transmission Facilities	Total Investment
1999	0.00	0.00	0.00
2000	0.00	0.00	0.00
2001	0.00	0.00	0.00
2002	0.00	0.00	0.00
2003	0.00	0.00	0.00
2004	20.13	0.67	20.80
2005	62.83	7.06	69.89
2006	0.00	0.00	0.00
2007	30.01	155.89	185.90
2008	0.00	0.00	0.00
2009	79.85	0.88	80.72
2010	0.00	168.10	168.10
2011	0.00	0.00	0.00
2012	0.00	18.68	18.68
2013	0.00	0.00	0.00
2014	0.00	0.00	0.00
2015	0.00	0.00	0.00
2016	400.63	96.53	497.16
2017	0.00	0.00	0.00
2018	0.00	0.00	0.00
2019	0.00	0.00	0.00
2020	0.00	0.00	0.00
2021	0.00	0.00	0.00
2022	201.72	92.34	294.06
2023	0.00	0.00	0.00
2024	176.51	46.23	222.73
2025	0.00	0.00	0.00
2026	0.00	0.00	0.00
2027	338.16	50.64	388.80
2028	0.00	0.00	0.00
Total	971.67	586.36	1,558.03

Source: Power Master Plan 2003 update

PERFORMANCE EVALUATION AND RATING

Performance Rating Scale and Evaluation Criteria

1. Rating Scale

$X \geq 3$ *highly satisfactory*

$2 \leq X < 3$ *Satisfactory*

$1 \leq X < 2$ *Unsatisfactory*

$X < 1$ *Highly unsatisfactory*

Where X is the value assigned to a performance variable.

Classification: Implementation performance is considered satisfactory if the average value of X is ≥ 2 .

2. Evaluation Results

Component Indicators	Score (1-4)	Remarks
1. Adherence to time schedule	2	Delay in project start-up of 34 months and delays in completion.
2. Adherence to cost schedule	4	Project was completed within the approved budget with some savings, used for additional extensions
3. Compliance with covenants	2	No slippage in loan effectiveness However, implementation of the undertaking given on tariff is still pending.
4. Adequacy of monitoring & evaluation and reporting	2	Complied with submission of all the relevant reports. Quality of reports questioned.
5. Satisfactory Operations (if applicable)	3	Works were well executed.
TOTAL	13	
<u>Overall Assessment of Implementation Performance</u>	2.6	Satisfactory

PERFORMANCE EVALUATION AND RATING

FORM BP 1

BANK PERFORMANCE

Component Indicators	Score (1 to 4)	Remarks
1. At Identification	-	
2. At preparation of project	3	A preparation mission led to project appraisal.
3. At appraisal	3	The appraisal was detailed and well prepared
4. At supervision	2	Technical and financial issues were resolved and adequate measures taken. However there were time over runs
Overall assessment of Bank Performance	2.67	Satisfactory

PERFORMANCE EVALUATION AND RATING

FORM PO 1
PROJECT OUTCOME

No.	Component Indicators	Score (1 to 4)	Remarks
1	<u>Relevance and Achievement of Objectives*</u>		
i)	Macro-economic policy	3	Well thought out and addressed such important issues as poverty alleviation
ii)	Sector Policy	3	Has formulated and is implementing energy and environmental policies
iii)	Physical (incl. Production)	3	Designed and constructed according to international standards.
iv)	Financial	2	The financial situation of TANESCO is weak and has been so for a long time.
v)	Poverty alleviation, social & gender	3	Project has achieved the objective of improving electricity access increasing employment and generating income in the rural and urban areas.
vi)	Environment	3	There were limited environmental impacts, which were adequately addressed during project implementation.
vii)	Private sector development	3	Provided electricity to many privately owned industrial enterprise, agro-based industries and the like. Improved their productivity,
viii)	Other (Specify)	-	
2	<u>Institutional Development (ID)</u>		
i)	Institutional framework incl. Restructuring	2	Restructuring of TANESCO still a long way from achieving tangible results.
ii)	Financial and Management Information Systems including Audit Systems	2	The management of Financial and management systems are still weak but improving
iii)	Transfer of Technology	3	There was transfer of equipment; on the job trainings provided the transfer of techniques and methodologies.
iv)	Staffing by qualified persons (incl. Turnover), training & counter-part staff	2	The project implementation staff was highly qualified and gained valuable experience. Training component not completed.

PERFORMANCE EVALUATION AND RATING

FORM PO 1

PROJECT OUTCOME

3	Sustainability	Score	Remarks
i)	Continued Borrower Commitment	3	Borrower has shown commitment with the launching of the preparation mission for Electricity V project.
ii)	Environmental Policy	3	An environmental policy has been formulated and is being implemented
iii)	Institutional Framework	2	The electricity Reg. Board has been established. But framework for TANESCO, the Executing Agency, is still weak capabilities
iv)	Technical Viability and Staffing	2	Adequate professional technical staff. There was poor maintenance culture.
v)	Financial viability including cost recovery systems	2	The investment of the project is financially viable.
vi)	Economic Viability	3	The investment for the project is economically viable.
vii)	Environmental Viability	3	Project is well monitored to ensure compliance with environmental policies and requirements.
viii)	O&M facilitation (availability of recurrent funding, foreign exchange, spare parts, workshop facilities etc.)	3	Sufficient funds and capacity for operations and Maintenance is available.
4	Economic Internal Rate of Return	3	EIRR : 6.33%
	Financial Internal Rate of Return	3	FIRR : 4.09%
	TOTAL	56	
	Overall Assessment of Outcome	2.67	Satisfactory

RECOMMENDATIONS AND FOLLOW-UP MATRIX

- The issue of electricity sub-sector reforms, including liberalisation, in African countries should be further studied with a view to finding approaches best suited to the conditions which obtain in these countries. (para 4.3.5)

Main Findings & Conclusions	Lessons Learned/ Recommendations	Follow-up Actions	Responsibility
<p><u>Project formulation and financing</u> The project was well formulated and thus attracted co-financing by the Bank Group as well as DANIDA and NDF. However, the cross effectiveness clause in the Bank Group Loans led to a delay of 32 months, which could have been reduced through closer donor coordination and synchronization of activities.</p>	<p>Closer co-ordination and synchronisation by the Bank of activities with those of other donors would have avoided or at least reduced the delay in loan effectiveness that occurred on this project. (para. 3.3.2)</p>	<p>For execution of projects of similar nature, the bank and other donors should closely coordinate their projects in any country to enhance implementation.</p>	<p>ADB</p>
<p><u>Project Implementation</u> There were delays during implementation.</p>	<p>Better understanding of the rules and procedures of the Bank and the importance of abiding by the rules and procedures, by the Borrower can save time during project implementation..(para 3.3.3)</p>	<p>Apart from the launching mission, training programme should be undertaken to educate prospective Borrowers on the Bank's rules and procedures.</p>	<p>GOT / ADB</p>
<p>The project audited accounts and reports do not meet Bank's requirements. It was only in November 2004 when the Bank conveyed its comments on the accounts for 2002 to the Borrower</p>	<p>The Bank should ensure that audit reports submitted by Borrowers are forwarded to the office of the Auditor General for review and comments; and that such comments are promptly conveyed to the Borrower. (para. 3.4.3 and 4.3.14)</p>	<p>This should be part of regular ongoing activities.</p>	<p>ADB</p>
<p><u>Institutional Performance</u> The general management and financial systems of TANESCO are still weak. The Government is continuing with the sector reform.</p>	<p>The Government should further reform TANESCO to enhance its management capability and improve its weak financial situation; (para 4.9.2, 6.3)</p>	<p>The sector reform already commenced by the Government needs to be sustained. This is an on-going activity, but one that requires more resources and attention.</p>	<p>GOT</p>
<p><u>Compliance with Loan Conditions & Covenants:</u> The Borrower was unable to fulfil two out of the original loan conditions i.e. tariff increase and reduction of accounts receivable</p>	<p>Loan conditions should be more rigorously examined to ensure appropriateness and where necessary, technical assistance be provided.(para 4.7.2)</p>	<p>Dialogue should continue on appropriate tariff structure. The borrower should ensure reductions in accounts receivable.</p>	<p>GOT/ADB/</p>

<u>Sustainability</u> Government is committed to rural electrification as part of an effort to increase accessibility.	Rural electrification should be done within the framework of electricity and energy policies and strategies for the country. (Para 6.5)	The Bank and GOT should review the national electrification and energy policy and strategy	GOT, ADB
There are massive investments requirements in the energy sector in which the private sector should be involved.	GOT should create an enabling environment to facilitate active participation of the private sector investment in the energy sector. The Bank and other donors can play a critical role in boosting investment to meet requirements in the sub-sector (para 6.6)	GOT should have further consultations with the private sector.	GOT
A number of Independent Power Producers are entering the sector in Tanzania.	There is a need to study the cost effectiveness of IPPs and their impact on tariffs; (para 4.3.6.)	The impact of their entry and operation should be carefully monitored and evaluated to establish their cost effectiveness.	GOT
Power system losses are high, a plain indication of the poor state of the system.	Time bound plans should be put in place to reduce the losses as a matter of urgency. . (Para 6.9)	The actions taken must be fitting and geared to achieving the desired results	GOT
Many studies have so far been undertaken and made conclusions and recommendations on the development of the power system in Tanzania.	These conclusions and recommendations should be coordinated and harmonised in order to arrive at a clearer picture of the direction to which the country is moving in the context of energy/ electricity policy formulation and effective implementation. (Para. 1.3)	These should be part of ongoing monitoring and evaluation of the programmes and activities in the electricity sub-sector	GOT
The current tariff structure has not adequately balanced the requirements for affordable price and reasonable return on investment.	The tariffs question should be given special priority as part of the Government's broader strategy of improving the grim financial situation of TANESCO and updating of a recent study should be speeded up. (para 4.3.8)	The evaluation of a recent study should be speeded up.	GOT
There were instances of poor maintenance of the distribution system in the project areas.	Effective operation and maintenance approaches should be nurtured and implemented in order to ensure sustainability of the power system; (para 6.8)	This should be part of ongoing activities by GOT and TANESCO	GOT
Many social benefits of the project were not because a base study to collect and analyse data on socio-economic profile of the project areas had not been undertaken	In future projects the Government should undertake a base study to better capture social benefits and thereby provide a bench mark for evaluating the effectiveness of projects after completion; (para.4.8.3)	The Bank should provide financial assistance on this. Suitable funding could be allotted in the project funding	

<p>The issue of electricity sub-sector reforms, including liberalisation, in Tanzania and indeed other African countries is a complex one, requiring further studies and evaluation.</p>	<p>The issue of electricity sub-sector reforms, including liberalisation, in African countries should be further studied with a view to finding approaches best suited to the conditions which obtain in these countries. (para 4.3.5)</p>	<p>Bank should finance the study.</p>	<p>ADB</p>
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