

KERALA STATE ELECTRICITY BOARD

**AGGREGATE REVENUE REQUIREMENT
&
EXPECTED REVENUE FROM CHARGES
FOR 2003-2004
AND
TARIFF PROPOSAL**



1st August 2003

Kerala State Electricity Board
Vydyuthi Bhavanam, Pattom, Thiruvananthapuram

**BEFORE THE HONOURABLE KERALA STATE ELECTRICITY
REGULATORY COMMISSION**

Filing No. 1/2003

Case No. _____

IN THE MATTER OF: **Application for approval of Revenue Requirement,
Expected revenue from charges and tariffs.**

And

IN THE MATTER OF: **Kerala State Electricity Board
Vydyuthi Bhavanam, Pattom,
Thiruvananthapuram – 695 004**

The petitioner named above respectfully showeth under:

1. This application for approval of Aggregate Revenue Requirement (ARR) for the year 2003-04 and approval of measures proposed to bridge the gap between ARR and the Expected Revenue from Charges (ERC), is being filed before the Honourable Kerala State Electricity Regulatory Commission, hereinafter referred to as Hon. Commission, in accordance with the provisions of the Electricity Act, 2003.
2. Proviso to Section 61 of the Electricity Act 2003 provides that *“that the terms and conditions for determination of tariff under the Electricity (Supply) Act, 1948, the Electricity Regulatory Commission Act, 1998 and the enactments specified in the Schedule as they stood immediately before the appointed date, shall continue to apply for a period of one year or until the terms and conditions for tariff are specified under this section, whichever is earlier.”*
3. The Electricity Act 2003 came into effect from 10-06-2003. The terms and conditions for determination of tariff as envisaged in Section 61 of the Electricity Act 2003 have not yet been specified by the Commission.
4. As per the above-mentioned Proviso of Section 61 of the Electricity Act, 2003, this application has been prepared in accordance with the relevant provisions of Indian Electricity Act, 1910, Electricity (Supply) Act, 1948 and Electricity Regulatory Commission Act, 1998.

5. Kerala State Electricity Board, hereinafter referred to as the Board, is a State Electricity Board constituted under Section 5 of the Electricity (Supply) Act, 1948 and is in the business of Generation, Transmission and Distribution of electricity.
6. This application for approval of Aggregate Revenue Requirement (ARR) for the year 2003-04 and approval of measures proposed to bridge the gap between ARR and the Expected Revenue from Charges (ERC), is being filed before the Honourable Kerala State Electricity Regulatory Commission, hereinafter referred to as Hon. Commission, in accordance with the provisions of the Electricity Act, 2003. As per Proviso of Section 61 of the Electricity Act, 2003, this application has been prepared in accordance with the relevant provisions of Indian Electricity Act, 1910, Electricity (Supply) Act, 1948 and Electricity Regulatory Commission Act, 1998.

Background

7. The Board has endeavoured to fulfil its obligation of making available good quality electricity at affordable rates to every class of consumers in accordance with their requirements. Over the last forty-five years, Board has grown from a total installed capacity of 111.5 MW to an installed capacity of over 2600 MW and created Transmission and Distribution network of over 2.3 lakhs circuit kilometres. At present the Board caters to the needs of more than 69 lakhs consumers spread over urban and rural areas in every nook and corner of the State.
8. This incremental growth in the power system also brought in several changes in the characteristics of the system. Owing to increasing requirements and slow addition to the hydel capacity, the system, which was predominantly hydel has now become almost 50% thermal and 50% hydel. Share of domestic consumption has increased to a level where the Domestic consumers consume approximately 43% of the total supplied power and share of HT & EHT Industrial consumers is consistently decreasing. These changes have led to a situation where the peak demand in the state is almost twice the off-peak demand. This resulted in investment in power system to meet the peaking demand and purchase of expensive thermal power for meeting peak requirements but the system remains under-utilised during the off-peak periods, resulting in idle capacity.
9. The combined effect of all the above factors was a significant increase in Board's expenditure and with tariffs not keeping pace with the rising costs, the Board's financial situation started deteriorating. At present, the Board is facing a severe financial crisis.
10. **Critical Issues Plaguing the Kerala Power Sector:** The Board published a Report on "Problems and Prospect" on 10th May 2002 containing details of the problems being faced by the Board and the steps taken to tackle some of these problems. Following are some critical issues that plague the Kerala Power Sector which are not strictly within the control of the Board.
 - Huge revenue deficit owing to tariff increases lagging far behind cost increases
 - Huge debt servicing obligations resulting from excessive borrowings in the past to cover revenue deficits and unpaid subsidy. At present, the debt-servicing burden of the Board is over 50% of its revenues from tariff.
 - Delay in implementation of hydel and transmission projects owing to environmental, social and other issues

- High cost of generation and purchase of thermal power, especially from naphtha and LSHS based plants
 - Changing consumer mix and tariffs much lower than the cost of supply for most of the consumers
 - Increasing subsidy requirements and non-receipt of the same in cash from the Government
 - Increase in expenses on account of failure of monsoon during FY 2002-03
 - Inadequate revenue collection and accretion to arrears
11. **Efficiency Improvement Initiatives:** The Board has taken several initiatives aimed at reducing costs and system losses, improvement in revenue collection and overall efficiency improvement. A few of the recent initiatives taken by the Board are as follows:
- Replacement of faulty meters: During FY 2002-03, approximately 4.22 lakhs faulty meters were replaced.
 - The billing and revenue collection systems are being computerized stage by stage.
 - Special Adalats are being conducted to dispose off disputes and billing complaints so that the revenue in such cases are not blocked by lengthy litigation process.
 - Stringent measures to cut down administrative expenses that include:
 - i) Shifting of offices from rented buildings to own buildings
 - ii) Hiring vehicles instead of purchasing new ones, as and when required
 - iii) Curtailing the telephone and transportation expenses
 - iv) Cutting down number of redundant posts of both staff and officers and freezing of filling of vacancies for three years
 - v) Redeployment of employees to vacant posts
 - vi) Cutting down certain allowances like leave-surrender and holiday wages and reducing disbursement expenses by stopping pension disbursement by money order.
 - vii) Controlling advertisement expenses
 - Sharing a part of power available from the Naphtha based plant of NTPC at Kayamkulam with Tamil Nadu to reduce fixed charge burden on the Board.
 - Accelerated Power Development and Reform Program (APDRP): Three circles Pathanamittha, Manjeri and Kasargode and seven cities viz Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Kozhikode, Thalassery and Kannur have been

selected for implementation under APDRP program of the Government of India. Under the APDRP program, replacement of meters provided at the LT consumer end by high precision meters and other system strengthening measures aimed at improvement of the services to the consumers, are planned.

- Swapping of high cost loans by low cost loans so as to reduce the burden of debt servicing.
- Judicious purchase of power by deriving the benefits under the Availability Based Tariff system.

Aggregate Revenue Requirement for the financial year 2003-04

12. The Board has projected its Net Aggregate Revenue Requirement for FY 2003-04 (i.e. all expenses plus statutory surplus less non-tariff income) to be Rs. 3625.57 Cr. This is higher by 127.41 Cr. as compared to FY 2002-03 (Rs. 3498.16 Cr.) and higher by Rs. 363.14 Cr. as compared to FY 2001-02 (Rs. 3262.43 Cr.).
13. The upward pressure on cost is primarily on account of ever increasing power purchase cost from thermal sources, increase in interest cost due to additional borrowings required to meet the cash deficit arising out of non-receipt of expected subsidy from the Government of Kerala in cash, and the other obligations of the Board including the increase in employee costs primarily towards terminal benefits of the retiring employees.
14. The Board has also drawn up a detailed capital expenditure program to strengthen transmission & distribution system with an aim to provide efficient service to the consumers. This has resulted in increase in the interest and finance charges on the borrowing to fund this expenditure. The Board is also undertaking new generation projects besides refurbishment of its generating stations, which would lead to extension of life and improvement in performance of these stations. This would result in enhanced availability of power at lower cost to the consumer.

Treatment of Revenue Gap

15. The projected revenue gap for FY 2003-04 is Rs. 941.71 Cr. This is based on Expected Revenue of Rs. 2683.86 Cr. from existing tariffs and the Net aggregate revenue requirement (i.e. all expenses plus statutory surplus less non-tariff income) of Rs. 3625.57 Cr.
16. The Board expects that a part of the revenue gap will be bridged by revenue subsidy and other releases from the Government of Kerala (GoK). The following subsidy components have been identified by the Board, which it expects to be approved by the GoK.
 - *During the financial year 2003-04, the Government is expected to release Rs. 175 crores in cash as provided in the State Budget.*
 - *Adjustment of the dues from KSEB (as shown below) to the GoK accruing during the year.*

- Sanction of an additional subsidy amount of Rs. 200 crores by GoK towards the revenue deficit through appropriate budgetary process.

The above-mentioned expected subsidy and other adjustments are summarized in the Table below:

Table 1. Expected Subsidy from GoK

Particulars	Rs. Cr
Amount to be paid in cash as per Budget Provision (A)	175.00
Amount not to be collected by GoK from KSEB (B)	181.46
E. Duty u/s 4 of the Kerala Electricity Duty Act, 1963 (KED Act)	153.78
E. Duty u/s 3(i) of the KED Act, 1963	27.68
Additional Subsidy to be provided by GoK in cash (C)	200.00
Total Subsidy (D = A+B+C)	556.46

17. The Board's intention is to minimize the rate shock to consumers and to maintain a smooth tariff trajectory while complying with the provisions of Section 59 of ESA. In the last two years the tariffs have been increased twice to reduce the ever-increasing gap between cost and revenue. With the intention to avoid increasing tariffs for the third consecutive year, it is proposed to meet the gap through a combination of expected subsidy support from GoK (as shown above) and postponing the recovery of rest of the revenue gap by forming a Regulatory Asset (to be recovered, along with the financing costs, in the subsequent years). In case the GoK does not agree to release the above mentioned subsidy and other adjustments, the Board prays to the Hon. Commission that the resultant deficit be covered through tariff increase or additional regulatory asset in addition to the levels proposed in this application, as the Hon. Commission deems fit.
18. Following table summarizes the Board's proposal regarding its ARR /ERC for FY 2003-04, revenue gap and measures to bridge the gap.

Table 2. Revenue Requirement and Proposal to bridge the Revenue Gap

	Description	FY 2003-04
		Rs. Crores
a	Aggregate Revenue Requirement (including Statutory Surplus)	3825.57
b	Non-tariff Income	200.00
c = a – b	Net Revenue Requirement from Tariffs	3625.57
d	Revenue at Current Tariffs	2683.86
e = c – d	Revenue Gap	941.71
f	Revenue Gap proposed to be covered by Tariff increase	0.00
g	Revenue subsidy expected from the GoK to partly cover the gap	556.46
h = e – (f + g)	Revenue Gap proposed to be covered by regulatory asset	385.25

Long Term Issues

- The Board would also like to submit certain proposals, which affect the Board's financial health and its ability to serve its consumers over a longer period. These proposals are
 - a. Regulatory assets to cover the uncovered revenue gap
 - b. Year end truing up of costs and revenues of the Board and allowing any unrecovered costs in the subsequent years, thereby, protecting the statutory surplus of the Board
 - c. Fuel and other cost adjustments (FOCA) formula to recover/repay certain uncontrollable cost increases/decreases on continuous basis. The cost changes which the Board would like to propose for FOCA pertains to factors outside the control of the Board such as power purchase costs, fuel price increases, etc.

Prayer

19. The Board requests the Hon. Commission that

- § The accompanying ARR /ERC for 2003-04 be approved;
- § The existing tariffs and other charges be allowed to continue
- § The accompanying proposal to bridge the revenue gap be accepted and accordingly an order is issued by the Hon. Commission as it deems fit;
- § The Government of Kerala be directed to pay the subsidy in cash (for the cash component) as proposed and in equal monthly instalments. The GoK may also be directed to abstain from collection of the amount due from KSEB during the year.
- § The uncovered revenue gap be treated as Regulatory Asset to be recovered through future tariffs.
- § The concept of truing up of Board's costs and revenues at the end of the financial year is accepted and any revenue gap arising out of this truing up exercise is allowed to be recovered through tariffs in the subsequent year; and
- § The Board is granted permission to submit fuel and other costs adjustment formula as a separate application for the Hon. Commission's approval.

The Board has made every effort to provide detailed information for computation of the revenue requirement and expected revenue. The Board is attempting to improve its management information system, which would enable it to provide improved data/information in the subsequent filings as may be required by the Hon. Commission.

20. The details of the enclosure are:

- Affidavit verifying the application
- ARR for 2003-04 and proposal to bridge the revenue gap
- Appendices and supporting documents, including detailed data formats

**BEFORE THE HONOURABLE KERALA STATE ELECTRICITY REGULATORY
COMMISSION.**

At its office at 30, Belhaven Gardens, Kawadiar P. O. Thiruvananthapuram.

FILING NO. 1/2003

CASE No.

IN THE MATTER OF:

Application for approval of Aggregate Revenue Requirement (ARR) for the year 2003-04 and approval of measures proposed to bridge the gap between ARR and the Expected Revenue from Charges (ERC) under section 29 of the Electricity Regulatory Commission Act 1998 and the section 59 of the Electricity (Supply) Act, 1948

AND

IN THE MATTER OF:

Kerala State Electricity Board, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram

Applicant.

Chairman,
Kerala State Electricity Board.

AFFIDAVIT VERIFYING THE APPLIATION ACCOMPANYING FILING OF PROPOSED TARIFF:

I, T. M. Manoharan, S/o Thaniyath Makkunni aged 51 years, residing at Forest Quarters No.2, Vazhuthacaud, Thiruvananthapuram do solemnly affirm and state as follows;

I am the Chairman of the Kerala State Electricity Board, Vydyuthi Bhavanam, Pattom, Thiruvananthapuram, and the petitioner in the above matter and I am duly authorized by the Board to make this affidavit on its behalf. I solemnly affirm at Thiruvananthapuram on this the first day of August 2003 that

(i) Contents of the above petition are true to my information, knowledge and belief. I believe that no part of it is false and no material has been concealed there from.

(ii) That the statements made in paragraphs of the accompanying application now shown to me are true to my knowledge and are derived from the official records made available to me and are based on information and advice received which I believe to be true and correct.

Deponent
Chairman,
Kerala State Electricity Board,
Vydyuthi Bhavanam, Pattom
Thiruvananthapuram – 695 004

VERIFICATION

I, the above named deponent solemnly affirm at Thiruvananthapuram on this, the first day of August 2003, that the contents of the affidavit are true to my information, knowledge and belief, that no part of it is false and that no material has been concealed there from.

Deponent
Chairman,
Kerala State Electricity Board,
Vydyuthi Bhavanam, Pattom
Thiruvananthapuram – 695 004

Solemnly affirmed and signed before me.

Advocate and Notary,

TABLE OF CONTENTS

1. INTRODUCTION	5
1.1 BACKGROUND.....	5
1.2 PRESENT STATUS OF POWER SECTOR IN KERALA	5
1.3 CRITICAL ISSUES PLAGUING THE KERALA POWER SECTOR	7
1.4 EFFICIENCY IMPROVEMENT INITIATIVES UNDERTAKEN BY THE BOARD	9
1.5 BOARD'S PHILOSOPHY UNDERLYING THIS APPLICATION.....	11
1.6 STRUCTURE OF THIS PROPOSAL	13
2. AGGREGATE REVENUE REQUIREMENT FOR FY 2003-04.....	14
2.1 OPERATING EXPENSES	15
2.2 CAPITAL RELATED EXPENSES.....	24
3. REVENUE FROM CURRENT TARIFFS AND PROPOSAL TO BRIDGE REVENUE GAP31	
3.1 ESTIMATED REVENUE REQUIREMENT AND REVENUE GAP	31
3.2 BOARD'S PROPOSAL TO COVER THE REVENUE GAP FOR FY 2003-04	32
4. LONG TERM ISSUES	39
4.1 INTRODUCTION	39
4.2 REGULATORY ASSET	39
4.3 YEAR END TRUING UP OF COSTS AND REVENUES OF THE BOARD	41
4.4 FUEL AND OTHER COST ADJUSTMENTS (FOCA) FORMULA	42
APPENDIX A: LOAD AND DEMAND PROJECTIONS	44
APPENDIX B: MERIT ORDER DESPATCH METHODOLOGY	46
APPENDIX C: WORKING CAPITAL COMPUTATION	50
DATA FORMS	53-85
APPENDIX D: EXISTING TARIFF SCHEDULE	

LIST OF TABLES

TABLE 1. EXPECTED SUBSIDY FROM GOK	VI
TABLE 2. REVENUE REQUIREMENT AND PROPOSAL TO BRIDGE THE REVENUE GAP	VI
TABLE 3. GROWTH IN KERALA POWER SECTOR.....	6
TABLE 4. CHANGING CONSUMPTION PROFILE.....	8
TABLE 5. HYDRO POWER AVAILABILITY DURING THE LAST THREE YEARS	9
TABLE 6. AGGREGATE REVENUE REQUIREMENT FOR FY 2003-04 (IN RS. CR)	14
TABLE 7. SALES, T&D LOSS AND POWER PURCHASE REQUIREMENT OF KSEB	15
TABLE 8. PROJECTED GENERATION AND POWER PURCHASE EXPENSES (FY 2003-04)	16
TABLE 9. FIXED COSTS FOR GENERATING STATIONS UNDER ABT	17
TABLE 10. VARIABLE COSTS FOR STATIONS UNDER ABT	17
TABLE 11. VARIABLE COST COMPUTATION FOR NTPC KAYAMKULAM STATION	18
TABLE 12. TRANSMISSION CHARGES	19
TABLE 13. OTHER POWER PURCHASE COSTS PAID BY BOARD (IN RS. CR)	19
TABLE 14. BRAHMAPURAM DIESEL PLANT	20
TABLE 15. KOZHIKODE DIESEL PLANT	20
TABLE 16. AVERAGE COST OF HYDEL GENERATION	20
TABLE 17. KANJIKODE WIND GENERATING STATION	21
TABLE 18. EMPLOYEES COST (RS. CR)	21
TABLE 19. ADMINISTRATION AND GENERAL EXPENSES (RS. CR)	22
TABLE 20. REPAIRS AND MAINTENANCE EXPENSES (RS. CR)	23
TABLE 21. R&M EXPENSES AS A PERCENTAGE OF OPENING BALANCE OF GROSS BLOCK	23
TABLE 22. CAPITAL WORKS IN PROGRESS (CWIP) (IN RS. CR).....	25
TABLE 23. ADDITION TO ASSETS CLASSES.....	25
TABLE 24. ORIGINAL COST OF FIXED ASSETS AT THE BEGINNING OF THE FINANCIAL YEAR (IN RS. CR)	26
TABLE 25. DEPRECIATION RATE AND DEPRECIATION	26
TABLE 26. INTEREST AND FINANCE CHARGES (IN RS. CR).....	27
TABLE 27. OUTSTANDING LOAN POSITION OF THE BOARD (RS. CR.).....	27
TABLE 28. OTHER INTEREST AND FINANCE CHARGES	29
TABLE 29. STATUTORY SURPLUS (IN RS. CR)	30
TABLE 30. REVENUE REQUIREMENT AND REVENUE GAP AT CURRENT TARIFF (RS. CR).....	31

TABLE 31. REVENUE FROM SALE OF ENERGY	32
TABLE 32. SUBSIDY RECEIVABLE	33
TABLE 33. ADJUSTMENTS OF DUES OF RS 2214.73 CRORES	33
TABLE 34. ADJUSTMENTS OF DUES OF RS 200 CRORES	33
TABLE 35. DUES ON ACCOUNT OF RE SUBSIDY	34
TABLE 36. SUBSIDY REQUIREMENTS DURING 1989-90 TO 1994-95.....	35
TABLE 37. SUBSIDY AND CROSS-SUBSIDY	36
TABLE 38. DEFICIT ON ACCOUNT OF HIGHLY SUBSIDISED DOMESTIC RATES FOR THE FIRST 40 UNITS CONSUMPTION PER MONTH	37
TABLE 39. REVENUE REQUIREMENT AND PROPOSAL TO BRIDGE THE REVENUE GAP (RS. CR).....	38
TABLE 40. CONSUMPTION DETAILS	44
TABLE 41. EXAMPLE – DEVELOPMENT OF REPRESENTATIVE UNRESTRICTED DEMAND CURVE FOR A MONTH.....	47
TABLE 42. AVAILABILITY SCHEDULE 2003-04 (IN MW).....	48
TABLE 43. MERIT ORDER STACK-UP.....	49
TABLE 44. WORKING CAPITAL REQUIREMENT.....	50
TABLE 45. SUBSIDY OUTSTANDING FROM GOK	52

ABBREVIATIONS USED

A&G	Administrative & General Expenses
APDRP	Accelerated Power Development and Reform Program
ARR	Aggregate Revenue Requirement
BKPL	BSES Kerala Power Limited
CERC	Central Electricity Regulatory Commission
CGS	Central Generating Station
CPP	Captive Power Plant
Cr	Crores
ERC	Expected Revenue from Charges
ERC Act	The Electricity Regulatory Commissions Act, 1998
ESA	Electricity (Supply) Act, 1948
ESO	Energy Sent Out
FY	Financial Year
GFA	Gross Fixed Assets
GoK	Government of Kerala
HQ	Head Quarter
IPP	Independent Power Producer
KED Act	Kerala Electricity Duty Act, 1963
KPCL	Kasargode Power Company Limited
KSEB or 'Board'	Kerala State Electricity Board
kV	Kilo Volt
kW	Kilo Watt
kWh	Kilo Watt Hour
LF	Load Factor
LT	Low Tension
MU	Million Units (Million kWh)
MW	Mega Watt
KAPS	Kaiga Atomic Power Plant
MAPS	Madras Atomic Power Plant
NPC	Nuclear Power Corporation
NTPC	National Thermal Power Corporation
PF	Power Factor
PFC	Power Finance Corporation
PLF	Plant Load Factor
PPA	Power Purchase Agreement
PTC	Power Trading Corporation
Rs	Rupees
R&M	Repair & Maintenance
SREB	Southern Region Electricity Board
T&D	Transmission & Distribution
ToD	Time of the Day
TNEB	Tamil Nadu Electricity Board

1. INTRODUCTION

1.1 Background

Kerala State Electricity Board (hereinafter referred to as “KSEB” or ‘the Board’) was established by the Government of Kerala in 1957, under Section 5 of the Electricity (Supply) Act, 1948 (ESA) to develop infrastructure relating to the State’s growing needs for electrical energy. Under Section 18 of the ESA, the Board, inter alia, has the obligation to arrange for the supply of electricity that may be required in the State and for the transmission and distribution of the same with particular reference to those areas that are not for the time being supplied or adequately supplied with electricity.

The Board has endeavoured to fulfil its obligation of making available good quality electricity at affordable rates to every class of consumers in accordance with their requirements. Over the last forty-five years, Board has grown from a total installed capacity of 111.5 MW to an installed capacity of over 2600 MW and created Transmission and Distribution network of over 2.3 lakhs circuit kilometres. At present the Board caters to the needs of more than 69 lakhs consumers spread over urban and rural areas across the State.

This incremental growth in the power system also brought in several changes in the characteristics of the system. Due to increasing requirements and slow addition to the hydel capacity, the system, which was predominantly hydel has now become almost 50% thermal and 50% hydel. Share of Domestic consumption has increased to a level where the Domestic consumers consume approximately 43% of the total supplied power and share of HT & EHT Industrial consumers is consistently decreasing. These changes have led to a situation where the peak demand in the state is almost twice the off-peak demand. This resulted in investment in power system to meet the peaking demand and creating expensive thermal power capacity for meeting peak requirements but the same remains under-utilised during the off-peak periods, resulting in idle capacity.

The combined effect of all the above factors was a significant increase in Board’s expenditure and with tariffs not keeping pace with the rising costs, the Board’s financial situation started deteriorating. This coupled with lack of adequate financial support from the GoK resulted in inadequate expenditure on the power system and consequently the quality of supply of power in the State suffered. From an enviable position of surplus power and sound financial health during nineteen seventies, the Board has run into problems on both technical and financial front since nineties.

At present, Board is finding it extremely difficult to even fulfil its fixed obligations towards power purchase, payment of interest on loan and loan repayment and has to resort to additional borrowings to fulfil these obligations. This precarious financial condition of the Board is not sustainable and efforts need to be made in all directions to bring back the Board to a position of financial sustainability.

1.2 Present Status of Power Sector in Kerala

Kerala is relatively poor in energy sources; it does not have any known reserves of coal, oil or natural gas. Its major source of electricity is hydel power. By effectively exploiting this source of electricity, the Kerala State Electricity Board, the primary agency responsible for electricity supply and development of power systems in the State, has been able to provide good quality supply of power at an affordable rate to its consumers.

Starting from an installed capacity of 5 MW and minimal transmission and distribution network in 1940, the Kerala power system has grown substantially. The table 3 provides a glimpse of the growth in the Kerala power system.

Table 3. Growth in Kerala Power Sector

Particulars	1951	1961	1980	1990	1995	2000	2002
Installed Capacity (MW)	38	133	1,012	1,477	1492	2,508	2,602
Annual Sales (MU)	140	518	4,318	4,898	7,081	9,813	8,667
Per Capita Consumption (kWh)	13	30	96	164	231	301	394
EHT Lines- Circuit (km)	911	1,900	4,404	5,770	6,106	7,599	9,325
EHT- S/S- (Nos)	12	22	86	130	157	178	195
HT Lines- Circuit (km)	1,067	5,449	13,348	19,627	24,509	28,672	31,088
LT Lines- Circuit (km)	992	8,899	47,606	95,838	125,390	180,499	191,469
Distribution Transformers (Nos)	324	2,898	10,821	16,394	22,478	29,551	32,282

The Board has also been an effective tool for the Government of Kerala (GoK) in implementing its policies relating to sections of the society that required particular attention of the government. It was felt that provision of relatively cheap electricity would be a key input in the economic and social development. This approach was not unique to Kerala, but was adopted in most of the States, with some of the states providing free electricity to certain consumer segments. Development of industry in the State was also facilitated significantly by providing them good quality power at a very competitive price compared to the neighbouring states. This is evident from the high share of energy intensive metal and chemical industries in the overall industries in the State.

In Kerala this was facilitated by the availability of cheaper hydel power. Kerala was energy surplus State after the commissioning of Idukki power plant in 1978. However, the development of hydel power resources has been slower in recent years on account of environmental and social concerns.

With the rising demand for power, particularly in the domestic sector, Kerala faces a peak hour supply shortage. Added to this is the high number of run-off the river hydel projects whose output cannot be controlled or shifted to a different time of the day. This results in having surplus power during most period of the day while shortage during the evening peak hours. With a major share of the demand from the domestic consumers, there is limited scope of shifting the demand pattern as well. The demand profile in Kerala is highly skewed with average demand to peak demand ratio being comparatively lower than that in other states. As of now the State has about 2602 MW of installed capacity (average peak available capacity of about 1400-1500 MW) as against a peak demand in excess of 2100 MW. The remaining peak demand is met by purchasing thermal power from central sector stations and IPPs. The situation has come to such a stage that the Board has been forced to adopt a forced load shedding during the peak hours of the day.

In addition to the demand and supply problems, the Board has been facing financial problems with subsidies not being paid in cash by the Government. Therefore, though on paper the Board has been showing the profits as required under the Electricity Supply Act, there is an actual cash shortage in the system. To meet the cash requirements, the Board borrowed quite frequently from the market at a time when the interest rates were very high (compared to the current rates). This has created a situation where mounting debt servicing has become a critical issue for the Board.

On the tariff front, most of the consumer categories currently have a tariff less than the average cost of supply. In addition, a sizeable amount of the revenues is locked in the form of receivables on account of litigations, lower collection efficiency and various other problems.

The problems of the power sector in the State have been debated at length, and the need for power sector reforms has been accepted across stakeholders. As a result, GoK pronounced Kerala Power Policy in 1998 outlining the steps that need to be undertaken to reform the sector. Establishment of State Electricity Regulatory Commission is one such step. On the part of the Board, as per Kerala Power Policy 1998, the Board has restructured its operation along the lines of generation, transmission and distribution profit centers and trying to improve operational efficiency in all areas.

1.3 Critical Issues Plaguing the Kerala Power Sector

The Board is facing severe liquidity crisis and it is becoming difficult to meet even its fixed obligations. It has been forced to borrow to meet even its revenue expenditure. This is leading to further deterioration in the financial condition of the Board. The Report on “Problems and Prospect” published by the Board on 10th May 2002 provided details of the problems being faced by the Board and the steps that are being taken to tackle some of these problems.

Following paragraphs describe some critical issues that plague the Kerala Power Sector but are not strictly within the control of the Board.

Revenue Deficit: As per the current estimates, the Board is expected to incur a revenue deficit of Rs. 1104.49 Cr. during FY 2002-03. The revenue gap is expected to be Rs941.71 Cr. during FY 2003-04 if no change is effected in the tariffs charged by the Board. Clearly a revenue deficit of Rs. 941.71 Cr. on an expected revenue of Rs. 2683.86 Cr. is not sustainable by any measure. Such huge revenue deficit (about 35% of revenue) results in reduced capacity to undertake adequate capital expenditure and also results in borrowing of additional funds. This has a dual effect of further increasing the revenue deficit and deteriorating the power system in the State, which is in dire need of funds.

As discussed later, most of the increase in the expenses during the past few years has resulted from reasons (such as increased thermal power purchases, change in consumer mix) which are beyond the control of the Board and even quantum improvements in efficiency will not be sufficient to wipe out the revenue deficit currently faced by the Board.

Capital Liabilities: The total outstanding debt of the Board as on 1st April 2003 is Rs. 4901.99 Cr excluding the outstanding amount in cash credit facilities with different banks. This huge outstanding debt of the Board is leading to two problems:

- Board is finding it difficult to borrow additional funds at favourable interest cost. This leads to high cost borrowing which worsen the already precarious financial condition. The Board's attempts to refinance its existing high cost loans have also suffered because of huge outstanding loan portfolio of the Board.
- A significant portion of Boards revenue (more than 50%) goes to servicing the debt leaving very little for other expenses of the Board. For FY 2002-03 the total debt servicing requirement is estimated at Rs. 1645.10 Cr. against estimated revenue of Rs. 2393.67 Cr. For FY 2003-04 also, total debt servicing requirement is projected at Rs. 1518.53 Cr. against expected revenue of Rs. 2683.86 Cr (at the existing tariffs). This debt-servicing requirement excludes the cash credit / Overdraft facility arranged by the Board from various commercial banks.

Delay in implementation of Hydel Projects: The details of the time and cost over runs in the implementation of hydel projects are well documented. In the recent past, the Board has not been able to add any significant quantity of hydel capacity owing to social and environmental issues and financial constraints. In fact, since the commissioning of Idukki in 1978, hydel capacity additions in the State has slowed down on account of these concerns and constraints. This has led to increasing dependence on the high cost thermal power.

High Cost of Generation and Purchase of Thermal Power: Kerala has no thermal energy sources of its own and hence, thermal power generation in the State is bound to be expensive as it depends upon imported fuel from other States or outside India. The thermal power purchased by the Board from central generating stations is also not very inexpensive. The Board has to pay nearly Rs. 50 Cr. per month as fixed cost to the Central Sector Generators (including NTPC's kayamkulam plant) and PGCIL for its allocated quota irrespective of whether the Board is drawing any power or not. In addition it also pays a variable cost on the basis of the energy drawn.

Similarly, the Board also has to pay a fixed and variable charge to the two IPPs, BSES Kerala Power Ltd. (BKPL) and Kasargode Power Corporation Ltd. (KPCL).

Thus, for thermal power purchase alone, the Board has to spend more than Rs. 130 Cr. per month. The increase in naphtha prices in the recent past has further increased the variable cost of power from naphtha-based plants.

Changing Consumer Mix and Inadequate Tariffs: Out of approximately 69 lakh consumers of the Board, about 60 lakh consumers pay tariffs lower than the average cost of supply. As stated earlier, the consumption profile in Kerala has also undergone a distinct change. A quick comparison of the consumer profile over the years shows the following:

Table 4. Changing Consumption Profile

S. No.	Consumer Category	Energy Consumption					
		1978-79		1994-95		2001-02	
		MU	%	MU	%	MU	%
1	Domestic	282	11.5	2300	32.74	3699	42.7
2	Commercial	144	6.0	954	13.57	796	9.2
3	Industrial LT	198	8.2	543	7.73	592	6.8
4	Industrial HT & EHT	1543	63.8	2598	36.96	2711	31.3
5	Agricultural	86	3.6	271	3.86	177	2.0
6	Public Lighting	35	1.5	113	1.61	151	1.7
7	Other Categories	131	5.4	249	3.53	541	6.3
	Total Sales	2419	100.00	7028	100.00	8667	100.00

As with the other SEBs in the country, this changing consumption profile is a cause of worry for the Board. With most of the consumer categories being subsidized either by the Government subsidy or by the cross-subsidy available from other consumers, the changing profile shows a marked increase in share of consumption by the highly subsidized categories such as Domestic. This significantly increases the requirement of subsidy from the GoK.

Increasing Subsidy Requirements and Non-payment of Subsidies: As the consumption mix changes in favour of highly subsidized categories such as Domestic, the requirement of subsidy increases. Over time, this resulted in Board becoming dependent on government subsidies, resulting in weakening of commercial orientation. For FY 2001-02, the total subsidy requirement was of the order of Rs. 1316.43 Cr. (about 67% of the total revenues from tariff of Rs. 1946 Cr. of the Board). In FY 2002-03, the subsidy requirement is estimated to be of the order of Rs. 1104.49 Cr. (about 46% of the total revenue from tariff). This

coupled with non-payment of subsidy by the government has created an insurmountable financial crisis for the Board. The Board has been forced to borrow additional sums to finance the unpaid subsidy resulting in higher debt servicing burden on the Board.

Increase in Actual Expenses on account of failure of monsoon: The Year 2002-03 has been comparatively difficult for the Board and its consumers. The year saw a significant failure of the monsoon. As Kerala has a high dependency on the hydel power, a failure of monsoon results in increased purchase from high cost thermal sources and also load-shedding. A comparison of the hydel power utilized during the current year with that in the previous two years is provided below:

Table 5. Hydro power availability during the last three years

	2000-01	2001-02	2002-03
	(Actual)	(Actual)	(Estimated)
Hydel Generation (MU)	6191	6689	4820
Energy input to T&D System (MU)	12464	12544	12479
% of Hydel Generation	49.67	53.32	38.62

It is evident from the above that the Board faced a significant difficulty in meeting the demand for energy from its hydel sources and had to purchase expensive thermal power during FY 2002-03 as compared to earlier years. Though this is not a permanent phenomenon, it deteriorated the financial condition of the Board significantly by putting an additional burden of approximately Rs. 420 Cr. on the Board.

1.4 Efficiency Improvement Initiatives Undertaken by the Board

The Board appreciates that merely increasing tariffs cannot make the utility viable. The overall efficiency of Board's operations has to be improved for long-term growth of this sector as well as other sectors in the economy. In the report on "Problems and Prospects" published by the Board on 10th May 2002, the Board has described a number of steps that are being taken to improve the operational efficiency of the Board. The Board intends to focus on three key areas where efficiency improvement can bring in substantial gains, namely

- Reducing T&D Losses
- Improving collection efficiency and reducing arrears, and
- Improving employee productivity.

In Kerala, though all the connections are metered, it is reported that a substantial number of meters are non-functional or defective, resulting in high commercial losses. While targeting an improvement in metering, the Board has initiated detailed programs for (a) more accurate estimation of T&D losses through extensive energy audit, (b) meter replacements (wherever meters are defective), and (c) measures for reduction of technical losses. The Board has also taken several steps to improve the collection efficiency; spot billing is one such example. The Board has also been trying to improve employee productivity by taking measures such as restructuring itself into profit centres, relocation and redeployment of the staff to field offices, computerisation of key activities, etc.

Following are some of the actions taken by the Board in the recent past:

- **Replacement of faulty meters:** In order to reduce the loss of revenue due to faulty meters, an intensive drive for replacing faulty meters has been undertaken. During the financial year (2001-02) alone, approximately 3.70 lakh faulty meters were replaced. In

the year 2002-03 about 4.22 lakh faulty meters were replaced. Wherever possible, electronic tamperproof meters are being installed in place of electro- mechanical energy meters.

- **Theft detection and prevention:** To reduce revenue loss owing to theft and misuse of electricity, Anti Power Theft Squads (APTS) are functioning in KSEB under the direction of Inspector General of Police (Security and Vigilance). A Deputy Chief Engineer heads the squads. Under his supervision, there are three regional units at Thiruvananthapuram, Ernakulam, and Kozhikode having eight Squads as follows:

Thiruvanthapuram	- 2 Squads
Ernakulam	- 3 Squads
Kozhikode	- 3 Squads

These squads periodically conduct surprise inspections at consumers' premises to detect any irregularity. During the period from June 2001 to December 2002, 2293 such cases were detected (19 of them involved criminal offence) and penal charges amounting to Rs. 19.72 Cr. were assessed.

Further, during the special operation "Vajra", conducted in coordination with State Vigilance wing and Electrical Inspectorate, penal charges amounting to Rs. 10.22 Cr. were assessed.

- **Indian Electricity (Kerala Amendment) Ordinance, 2003:** This ordinance has been passed recently to enable the Board to take stringent action against theft and pilferage of power and make it as a cognizable offence.
- **Computerization of billing and collection:** The Billing and revenue collection systems are being computerized stage by stage. The billing of Extra High-Tension consumers has already been computerized and that of all HT consumers is expected to be completed within next three months.
- **Dispute settlement:** The Board is taking action to identify and dispose off disputes and billing complaints early so that the revenue in such cases are not blocked by lengthy litigation process.

Special "Adalats" are also being conducted to dispose off disputes and billing complaints early so that the revenues in such cases are not blocked by lengthy litigation process.

- **Reduction in administrative expenses:** The Board has also taken stringent measures to cut down administrative expenses that include:
 - a. Shifting of offices from rented buildings to own buildings
 - b. Hiring of vehicles as and when required instead of purchasing new ones.
 - c. Limiting telephone and transportation expenses
 - d. Reduction in number posts by cutting down redundant posts of both staff and officers and freezing of filling of vacancies for three years
 - e. Redeployment of employees to vacant posts
 - f. Curtailing certain allowances like leave surrender and holiday wages and reducing disbursement expenses by stopping pension disbursement by money order.

- g. Controlling advertisement expenses
- **Reduction in power purchase costs:** The Board has succeeded in sharing a portion of the total capacity of Kayamkulam thermal power plant with neighbouring state (Tamil Nadu). This has reduced the Board's fixed charge obligation towards Kayamkulam plant.

1.5 Board's Philosophy Underlying this Application

With the enactment of the ERC Act 1998 and the institution of the Hon. Commission under the same in November 2002, the power sector in Kerala has entered a new regime. The Board is required to place before the Hon. Commission its revenue requirement for the year and its proposals to meet the same. The Board's tariffs are to be approved by the Hon. Commission based on the guidelines provided in the ERC Act 1998 and principles laid down in ES Act 1948. The ERC Act 1998 provides the following guidelines with respect to the tariff setting process for the Board:

".....The State commission shall determine by regulations the terms and conditions for the fixation of tariff and in doing so, shall be guided by the following, namely:

- a)*;
- b) In the case of the board or its successor entities the principles under section 59 of the Electricity (Supply) Act, 1948 (54 of 1948);*
- c) That the tariff progressively reflects the cost of supply of electricity at an adequate and improving level of efficiency;*
- d)*;
- e) The interests of the consumers are safeguarded and at the same time, the consumers pay for the use of electricity in a reasonable manner based on the average cost of supply of energy;*
- f) The electricity generation, transmission, distribution and supply are conducted on commercial principles;....."*

Section 59 of the ESA 1948, which govern the tariff setting for the Board provides that

".....The Board shall, after taking credit for any subvention from the State Government under section 63, carry on its operation under this Act and adjust its tariffs so as to ensure that the total revenues in any year of account shall, after meeting all expenses properly chargeable to revenues, including operating, maintenance and management expenses, taxes (if any) on income and profits, depreciation and interest payable on all debentures, bonds and loans, [leave such surplus as is not less than three percent, or such higher percentage, as the State Government may, by notification in the Official Gazette, specify in this behalf, of the value of the fixed assets of the Board in service at the beginning of such year....."

This application of the Board attempts to embody the above principles enshrined in the Acts governing the tariff setting process for the Board. Based on the above principles, the Board's philosophy underlying this application has been that

- q Consumers should gradually pay tariff sufficient to allow the Board to recover its costs.
- q The utility should operate efficiently and commercially
- q Provision of subsidy is, primarily, the responsibility of the Government.

It is recognized that an immediate adoption of all these principles, from the present situation, is not practical and the Board expects a gradual movement towards cost reflective tariffs and desired efficiency levels. Therefore, the Board believes that the tariff setting process should take into account the current level of tariffs to ensure that there is no “tariff shock” for the consumers and if required recovery of a part of the revenue requirement be postponed in the form of a regulatory asset.

1.5.1. Financial Viability is of Paramount Importance

The recovery of costs is of paramount importance to ensure financial viability of the Board. The ES Act 1948 requires the Board to earn sufficient revenues to cover all costs and earn a minimum level of return. The strict application of this principle assumes importance in view of the following considerations:

- q Sound financial health of the Board would be essential to enable it to raise funds critical for system improvements and reduction of line losses, thereby benefiting the consumers in the end.
- q The liquidity problems faced by the Board severely affects its ability to undertake routine maintenance, granting of new connections, purchasing of consumables like transformer oil, and making payments to its suppliers. This affects its quality of supply and at times has led to severe criticism of the Board by the public.

In this proposal, the Board is requesting the Hon. Commission to provide for the recovery of most of the costs of the Board and allow the financing cost of the remaining part (Regulatory Asset) such that the Board’s financial viability is ensured.

1.5.2. Procedure for subsidy payment

In the past, the State Government was deemed as able and willing to absorb losses through subsidies and liability adjustments. However, the Board’s experience shows that such subsidy is not paid in cash.

One of the important considerations underlying this tariff proposal is that the legislation recognises that providing subsidy is the responsibility of the Government. Section 29(3) of the Electricity Regulatory Commissions Act (ERC Act) outlines the factors on which tariffs could be differentiated. Further, Section 29(5) of the ERC Act (1998) provides that

“.....If the State Government requires the grant of any subsidy to any consumer or class of consumers in the tariff determined by the State Commission under this section, the State Government shall pay the amount to compensate the person affected by the grant of subsidy in the manner the State Commission may direct.....”

The overall tariff setting exercise should be seen in line with the provisions of Section 29(5) of the ERC Act 1998. The procedural methodology of determination and upfront transfer of subsidy amount to the Board has not been established by the Government till date, leading to loss of revenue and liquidity problems. This proposal requests the Hon. Commission to address this issue as mandated in Section 29(5) of the ERC Act 1998. The Hon. Commission is requested to stipulate detailed directions to ensure that cash flows and revenues of the Board are not affected adversely, by providing the agreed subsidy amount in cash.

For FY 2003-04, the Board prays to the Hon. Commission to ensure that the subsidy committed by the Government be paid in cash to the extent of the provision of Rs. 175 crores in the State Annual Budget and an additional amount of Rs. 200 crores be paid in cash as may be agreed upon by the Government. The Board also prays to the Hon. Commission to suitably

direct the GoK that the dues payable by the Board such as Electricity duty, for the year 2003-04 be not collected from the Board and be considered as grant or additional subsidy for the year 2003-04. The Board expects that these measures would result in a total cash flow of Rs 556.46 Cr. from the GoK.

It is proposed that the Rs. 385.25 Cr. of uncovered gap be treated as a Regulatory Asset, and be allowed to be amortized in the ARR for subsequent years and allow the financing cost of the asset as allowable expense in the ARR. It may be appreciated that an increase in the Regulatory Asset or non-receipt of subsidy in cash from GoK would aggravate the cash flow problem for the ensuing year.

1.6 Structure of this Proposal

Apart from this Introductory Section, this proposal has three more Sections. The Second Section describes the Board's estimate of its Aggregate Revenue Requirement for FY 2003-04. Treatment of Revenue Gap is discussed in Section 3. The last Section includes a discussion on the concepts of regulatory asset, year-end truing up of costs and revenues and necessity of a fuel and other costs adjustment formula. At the end of these Sections, there are four Appendices – Appendix-A on load and consumption projections, Appendix B on merit order despatch methodology adopted for this application, Appendix C on assumptions for projecting working capital requirement, and Appendix-D provides the notifications for the existing tariffs. At the end there is a series of data forms providing the details of the ARR and Tariff related statistics.

2. AGGREGATE REVENUE REQUIREMENT FOR FY 2003-04

The Board has projected its Aggregate Revenue Requirement for FY 2003-04 (i.e. all expenses plus statutory surplus less non-tariff income) to be Rs. 3625.57 Cr. Following table summarizes the revenue requirement and its various components.

Table 6. Aggregate Revenue Requirement for FY 2003-04 (in Rs. Cr)

Particulars	2001-02 (Provisional)	2002-03 (Estimate)	2003-04 (Projection)
Statutory Surplus (a)	62.85	80.78	99.25
Total Expenditure (b)	3,295.44	3,603.38	3,726.32
Power Generation	84.60	166.52	263.17
Power purchase	1,451.55	1,865.17	1,592.63
Interest	648.95	676.62	741.69
Depreciation	212.61	272.88	334.52
Employee Cost	615.00	651.50	750.50
R & M	70.32	49.41	102.53
Admin & General	66.40	60.84	71.74
Other Expenses	399.70	138.32	143.53
Less: Expenses Capitalized	124.82	132.15	151.93
Less: Interest Capitalized	128.87	145.72	122.05
Less: Non-Tariff Income (c)	95.86	186.00	200.00
ARR (d = a + b - c)	3,262.43	3,498.16	3,625.57
Less: Revenue from tariffs (e)	1,946.00	2,393.67	2,683.86
Revenue Gap (f = d - e)	1,316.43	1,104.49	941.71
Less: Subsidy (g)	1,316.43	1,104.49	556.46 ¹
Net Revenue Gap (h = f - g)	0.00	0.00	385.25

The details of and the basis for the projection of various expenses are provided in the following sub-sections.

The various expenses have been broadly categorized into operating expenses and capital related expenses. Operating expenses include generation and power purchase expenses, employee expenses, Administrative and General expenses, R&M expenses and expenses pertaining to the provision for doubtful debt. Capital related expenses include interest, depreciation and statutory return on net fixed assets.

¹ The net revenue gap has been computed assuming receipt of this subsidy from the Government of Kerala.

2.1 Operating Expenses

2.1.1. Generation and Power Purchase Expenses

The generation and power purchase expenses are determined based on the extent of generation/power purchase expected from each source, the variable cost of generation / power purchase from each source and the fixed costs of power purchase from each source.

The consumer category-wise load projection and consumption details are discussed in Appendix A. Following table summarizes the computation of total energy requirement of the Board to service the projected consumption of energy.

Table 7. Sales, T&D loss and Power Purchase requirement of KSEB

Particulars	2001-02 (Actual)	2002-03 (Estimate)	2003-04 (Projection)
LT Sales (MU) (A)	5,499	5,529	5,874
HT & EHT Sales (MU) (B)	3,169	3,177	3,206
Total Sales (MU) (C= A+B)	8,668	8,707	9,080
Energy Input to KSEB System (MU) (D)	12,544	12,479	12,353
KSEB System T&D Loss (MU) (E=D-C)	3,876	3,772	3,274
T&D Loss (% of KSEB system Input) (F=E/D)	30.90%	30.23%	26.50%
Total Power Purchased and net energy generated (MU) (G)	12,784	12,717	12,615
Gross T&D Loss (MU) (H=G-C)	4,116	4,011	3,535
Gross T&D Loss (as % of energy purchased and generated) (MU) (I=H/G)	32.20%	31.54%	28.02%

It can be observed from the Table 7 that the Board's total energy input (net generation + purchase) for the year 2003-04 is projected to be 12,615 MUs as compared to 12,717 MUs in 2002-03. Accordingly, while the Board's estimated sales in 2002-03 is 8,707 MUs, for the year 2003-04 it is projected to be 9080 MUs.

The *merit order despatch* methodology for minimization of generation and power purchase expenses has been discussed in detail in Appendix B. Appendix B also provides the energy drawn from each generating station on the basis of the merit order despatch methodology.

The table below provides the summary of the cost of generation and power purchase on the basis of utilising the merit order despatch methodology for the ensuing year 2003-04.

Table 8. Projected Generation and Power Purchase Expenses (FY 2003-04)

Source	Energy Produced/ Purchased	Auxiliary Consumption	External Loss	Net Energy Input to KSEB T&D system	Fixed Cost	Incentive, Tax, etc.	Variable cost /Unit	Total Variable cost (including Variable Transmission Cost)	Total Cost
	MU	MU	MU	MU	Rs. Cr	Rs. Cr	Rs/kWh	Rs. Cr	Rs. Cr
Hydel	5,658	28	-	5,630	-	-	0.03	19.75	19.75
Wind - Kanjikode	3	-	-	3	-	-	0.25	0.07	0.07
BDPP	378	17	-	361	-	-	2.73	98.54	98.54
KDPP	587	26	-	561	-	-	2.58	144.82	144.82
RSTPS	1,966	-	100	1,866	83.44	24.00	0.94	184.24	291.68
MAPS	84	-	4	80	-	-	2.11	17.74	17.74
NLC - I	394	-	20	374	18.11	20.00	0.71	28.12	66.23
NLC - II	558	-	28	530	40.10	-	0.99	55.47	95.57
Kaiga	359	-	18	341	-	-	3.40	122.19	122.19
ER	634	-	32	602	-	9.50	1.89	119.88	129.38
Kayamkulam	217	-	-	217	129.92	20.00	3.21	69.72	219.64
BKPL	328	-	-	328	124.26	-	3.10	101.78	226.04
KPCL	141	-	-	141	18.07	-	3.82	53.73	71.79
NLC (NEW)	286	-	15	272	33.99	0.90	0.98	28.06	62.96
Talcher - II	874	-	44	830	44.79	1.29	0.44	38.47	84.54
PTC	218	-	-	218	-	-	2.05	44.77	44.77
PGCIL Charges									
Eastern Region					-	1.90	0.14	9.12	11.02
Southern Region					99.67	5.60		-	105.27
Kayamkulam					43.81			-	43.81
Total	12,686	71	261	12,353	636.15	83.19		1,136.47	1,855.80

The total power cost during FY 2003-04 is expected at Rs 1855.80 Cr. including Rs. 263.17 crores of variable cost of own thermal generation from BDPP and KDPP and hydel and wind generation. It is to be noted that the fixed costs of hydel plants, BDPP and KDPP have not been considered here, as they have been projected along-with the other cost projections of the Board.

The estimate of the purchase cost for the FY 2002-03 has been made based on the billing during the FY 2002-03 and an estimate of the incentives, tax and other charges normally raised by the generators through supplemental bills at the end of the year. The ensuing year projections have been made as per agreements, wherever applicable, and considering an average increase of 5% in the unit variable cost prevalent in March 2003 in other cases. The station-wise computation of power purchase and generation costs is discussed below.

NTPC and NLC Stations under ABT: With effect from January 2003, the stations of NTPC and NLC have come under ABT. As per the Regional Energy Accounting (REA) under ABT, the fixed cost of the station is to be shared by the constituents of SREB in proportion to their allocation. As a consequence, the variable costs of these stations are lower than the earlier pooled cost (which depended on the actual drawl by the constituents) and thereby will have an impact on the Merit Order Despatch.

The fixed costs for the stations under ABT are shown below:

Table 9. Fixed Costs for Generating Stations under ABT

Station	Capacity	Total Allocation to KSEB	Annual Fixed Cost	KSEB Allocation	KSEB Share of Fixed Cost
	MW	MW	Rs. Cr	%	Rs. Cr
Ramagundam STPS	2100	307	571.50	14.60%	83.44
Talcher II- (Unit II) ²	500	70	319.91	14.00%	44.79
NLC-I	580	67	157.50	11.50%	18.11
NLC-II	790	96	328.67	12.20%	40.10
NLC Expansion	500	60	283.24	12.00%	33.99

The variable costs of these stations are based on respective agreements and tariff orders, variable costs charged by these stations in their March 2003 bills and an expected increase of 5% for 2003-04. Following table summarizes the variable costs for these generating stations.

Table 10. Variable costs for Stations under ABT

Generating Station	Variable cost as per March '03 Bill	Escalation assumed for 2003-04	Variable cost projected for 2003-04
	Rs./kWh	%	Rs./kWh
Ramagundam STPS	0.89	5%	0.94
Talcher ³	0.44	0%	0.44
NLC-I	0.68	5%	0.71
NLC-II	0.95	5%	0.99
NLC Expansion ⁴	0.98	0%	0.98

Nuclear Power Corporation (NPC): KSEB has an allocated share in the Madras Atomic Power Station (MAPS) based at Kalpakkam. The fixed cost of the station is distributed among the SREB constituents in proportion to their actual drawal. During March 2003, the total cost per unit of drawal came to Rs 2.01. This cost with an expected escalation of 5%, that is Rs. 2.11 per unit is used for 2003-04 projections.

KSEB also has a share from the Kaiga Atomic Power Station (KAPS). The station has two units of 220 MW operational from 16.03.2000 and 16.11.2000. As per the agreement with KSEB dated 29.12.2000 and the tariff schedule therein, the average rate from 01.07.2002 to 30.06.2003 is Rs. 3.25 per unit and that from 01.07.2003 to 30.06.2004 is Rs. 3.40 per unit. These rates have been taken for computing the cost of power purchase from KAPS.

² Talcher II Fixed cost shown is 75% of the annual fixed cost as this is applicable from July 2003 only

³ Based on the tariff filing by NTPC

⁴ Based on the tariff filing by NLC

Kayamkulam Thermal Power Station (NTPC): The 360 MW Kayamkulam thermal power station of NTPC is a Naphtha based plant wholly dedicated for Kerala. However, utilization of the station has been far below the potential owing to i) low demand during major part of the day and ii) the high fuel cost resulting in high cost of power. In spite of the comparatively low utilization, the annual fixed cost of Rs 259.84 crores have to be borne by the Board.

Recently, the Board has succeeded in getting Tamil Nadu to share a part of the capacity on an infirm basis. As per this agreement, the fixed cost of the plant is shared in equal proportion between KSEB and TNEB. Therefore, the annual fixed cost of Kayamkulam plant for the Board has been taken as half of the total annual fixed cost of the station, i.e. Rs. 129.92 Crores.

The variable cost of power from the station is calculated using the formula specified in the PPA. For the purpose of projecting the variable cost during FY 2003-04, the parameters as per the March 2003 bill have been used including the weighted average fuel costs. However, it must be mentioned here that predicting the Naphtha price is very difficult and the assumption only reflects an average expectation and cannot be taken as a commitment from the Board. In case of changes in the fuel price, the projected source-wise energy drawal schedule would also change as per the changed merit order schedule. The detailed calculation of the variable cost is as follows:

Table 11. Variable Cost Computation for NTPC Kayamkulam Station

Normative Heat Rate for CC Ops (H)	Kcal/kWh	2000
Wtd Avg. GCV of Fuel (G)	Kcal/Kg	11317
Wtd. Avg. Price of Fuel (P)	Rs/MT	17591
Normative Auxiliary consumption for CC Ops (A)	%	3.02%
Energy Sent Out (E)	kWh	1
Variable Charge per unit (VC)	Rs/kWh	3.21
$VC = \{(H/G) \times (P/1000) \times E / (100-A)\} / E$		

Eastern region and other States: The Board also purchases power from Eastern Region and other States to meet its shortage situation. The power is procured from these sources on an infirm basis depending upon the requirement, except for 81 MW from Eastern Region that has been contracted on a firm basis.

During FY 2002-03, the average cost per unit of energy from Eastern Region was Rs. 1.74 and the associated wheeling charge was Rs. 0.14 per unit. During March 2003, the average per unit rate for NTPC(ER) power was Rs. 1.80 per kWh. For the purpose of projection for FY 2003-04, the variable energy charge has been adopted as Rs. 1.89 per unit (equal to variable charge during FY 2002-03 and an increase of 5%), while the associated wheeling charge has been assumed at the existing Rs. 0.14 per unit.

Independent power projects (IPPs) and Captive Power Plants (CPPs): The Board has entered into power purchase agreements with two IPPs, BSES Kerala Power Limited (BKPL) and the Kasargode Power Corporation Limited (KPCL).

Based on the PPAs signed, the Fixed Cost commitment towards BKPL has been projected as Rs. 124.26 crores for FY 2003-04. The variable cost has been computed as Rs. 3.10 per unit based on an expected fuel cost of Rs. 17591 per MT (same as March 2003 cost for Kayamkulam plant of NTPC) and the PPA specified Fuel Conversion Factor (FCF) of 0.1763 for Combined Cycle operation.

Similarly for KPCL, the Fixed Cost commitment for 2003-04 has been projected at Rs. 18.07 crores and the variable cost at Rs. 3.82 per unit based on a fuel price of Rs 17267 per MT (LSHS) and Fuel Conversion Factor (FCF) of 0.2163. In addition, Lubricating oil price of Rs

Kerala State Electricity Board

79605.81 per MT and conversion factor of 1.1 gm per kWh has been adopted. The rates are as per the March 2003 bill and the conversion factors are as per the PPA.

The Board also has agreement to buy power from captive power plants like Kuthungal and Maniyar in case there is excess power available after meeting the captive requirements. As these are infirm sources, the availability for the Board from these sources has been taken as nil.

Transmission Charges payable to PGCIL: With effect from January 2003, PGCIL charges for Southern Region are allocated on the basis of weighted average share of the Board in the Southern Region. Charges payable to PGCIL for the two dedicated lines for drawal of power from NTPC's Kayamkulam station are fixed in nature. The following table shows the projected charges payable to PGCIL for drawal from Southern Region and Kayamkulam.

Table 12. Transmission Charges

Southern Region	Total Cost	KSEB Share	KSEB Cost
	Rs. Cr	%	Rs. Cr
Transmission Charges	54.06	13.18%	7.12
TNEB Transformer Charges	0.15	14.14%	0.02
ULDC Charges – Central	2.08	13.18%	0.27
ULDC Charges – State	0.88	100.00%	0.88
Total Per Month Transmission Fixed Cost SR			8.31
Total Annual Transmission Fixed Cost SR			99.67
Kayamkulam	Kmklm-Edamon Line	Kmklm-Pallom Line	Total
Monthly Charge as per Feb'03 Bill	2.21	1.44	3.65

Other Charges payable to CPSUs: Other than the monthly charges on energy and capacity, the Board also has to pay miscellaneous charges associated with power purchase. These primarily comprise of incentives, income tax, water charges, foreign exchange rate variation (FERV), etc. The amounts paid on these accounts during the last two years (cost estimation for 2002-03 based on bills upto October 2002) as well as projections for FY 2003-04 are as follows:

Table 13. Other Power Purchase Costs paid by Board (in Rs. Cr)

Particulars	2001-02	2002-03 (Estimate)	2003-04 (Projection)
Water Charges	0.12	-	-
Water Cess	0.04	0.01	-
Income Tax ⁵	42.40	48.47	66.00
Incentive	11.03	12.67	14.19
Air & Water Consent fee	0.00	0.01	-
FERV	1.12	-	3.00
Other Charges (related to ULDC & SRLDC)	0.42	7.51	-
Total	55.15	68.68	83.19

⁵ For FY 2003-04, income tax as currently claimed by NTPC Kayamkulam, has been considered

Generation Cost of Board's Own Thermal Stations: The variable cost of generation from the Board's own plants are as per actual expenses incurred in 2002-03. The same level of variable cost per kWh of energy has been assumed for 2003-04. The Tables below provide the details of costs during 2002-03.

Table 14. Brahmapuram Diesel Plant

BDPP	2002-03
Cost of Fuel	
HSD (Rs. Cr)	2.77
LSHS (Rs. Cr)	63.66
Lub oil (Rs. Cr)	2.24
Total Fuel Cost (Rs. Cr)	68.67
Cost of Other Consumables (Rs. Cr)	0.92
Total Variable Cost (Rs. Cr)	69.59
Energy Generated (Gross) (MU)	266.87
Aux. Cons. (MU)	11.62
Net Energy Available (MU)	255.25
Variable cost per kWh of Net Energy (Rs/kWh)	2.73

Table 15. Kozhikode Diesel Plant

KDPP	2002-03
Cost of Fuel	
HSD (Rs. Cr)	0.17
LSHS (Rs. Cr)	94.91
Lub oil (Rs. Cr)	1.09
Chemicals (Rs. Cr)	0.03
Total Fuel Cost (Rs. Cr)	96.21
Cost of Other Consumables (Rs. Cr)	0.73
Total Variable Cost (Rs. Cr)	96.93
Energy Generated (Gross) (MU)	386.96
Aux. Cons. (MU)	11.50
Net Energy Available (MU)	375.46
Variable cost per kWh of Net Energy (Rs/kWh)	2.58

Cost of KSEB's Hydel Generation: The variable cost of generation associated with hydel power is very low. These costs are primarily on account of lubricating oil and other consumables required for running the plants. Based on data available for the year 2001-02, the average per unit costs have been worked out as follows:

Table 16. Average cost of hydel generation

Cost of Lubricants, etc.	Energy	Variable Cost
Circle	MU	Rs
Kothamangalam	893.34	4246258
Thrissur	769.26	8582520
Chithirapuram	625.27	11180923
Mozhiyar	1657.44	14443087
Moolamattom	2744.64	6568308
Total	6689.95	45021096
Other variable cost (Rs)		132067917
Variable cost per kWh (Rs/kWh)		0.03

The variable cost has been reduced from the projected repairs and maintenance cost on plant and machinery.

Cost of Wind generation:

As is the case with Hydel generation, there are some variable costs associated with Wind generation as well, primarily on account of consumables. The 2002-03 costs are as follows:

Table 17. Kanjikode Wind Generating Station

Wind Power	2002-03
Total Variable Expenses (Rs. Cr)	0.11
Generation (MU)	4.32
Average Variable Cost (Rs/kWh)	0.247

As with Hydel generation, this cost also has been reduced from the projected repairs and maintenance cost for plant and machinery.

2.1.2. Employee Expenses

Following table summarizes the projection of employee expenses for FY 2003-04 along with previous year's expenses.

Table 18. Employees Cost (Rs. Cr)

Particulars	2001-02	2002-03	2003-04
	(Provisional)	(Estimate)	(Projection)
Salaries and Wages (Basic + DA)	336.31	338.19	398.34
Holiday Wages / Overtime	12.05	0.60	0.60
EL encashment	36.55	31.23	33.40
Other Allowances/Bonus/Benefits	27.33	25.88	25.82
Terminal benefits	202.76	255.60	292.33
Total	615.00	651.50	750.50

The estimated expenses that is expected for the year 2002-03 is Rs. 651.5 Cr. as compared to Rs. 615 Cr. in the previous year (FY 2001-02). The projection for 2003-04 is Rs. 750.5 Cr., due to expected increase of about Rs. 60 Cr. on Basic salaries and DA (primarily on account of arrears of DA payments) and about Rs. 37 Cr. on Terminal benefits to the employees.

The Board has projected the increase in "Terminal Benefits" keeping in view the high number of employees scheduled to retire in the ensuing year.

The Board has made substantial efforts to reduce the Staff Costs and Administrative Expenditure. This has been made possible through measures such as:

- Improving the productivity of existing employees.
- Drastic reduction of payment of Over Time charges.
- Cutting down the number of redundant posts of both staff and officers and freezing of filling of vacancies for three years.
- Limiting the increase in the officers' salary to the end of the pay scale

- Redeployment of employees to vacant posts.
- Cutting down certain allowances such as leave surrender and holiday wages and reducing disbursement expenses by stopping pension disbursement by Money Order.
- Imposition of travel discipline.

The amount of employee costs to be capitalized has been estimated on the basis of the past trends and the projected employee costs for the ensuing year as most of the construction work of the Board is carried out on turnkey basis where these costs are already included in the project cost. The underlying assumption is that the same set of people and same administrative set up would be used for construction work and therefore the related cost would follow the overall trend for the Board.

2.1.3. Administration and General Expenses

The Administration and General (A&G) expenses consist of rents, taxes, insurance, legal charges, audit fees, Electricity Duty under Section 3 (i) of the Kerala Electricity Duty Act (KED Act) and other charges such as travel expenses, freight, purchase related expenses, etc. Following table summarizes the projection for A&G expenses along with the previous year expenses.

Table 19. Administration and General Expenses (Rs. Cr)

Particulars	2001-02	2002-03	2003-04
	(Provisional)	(Estimate)	(Projection)
Rents, Rates and Taxes	3.06	3.06	3.06
Insurance	1.44	1.44	2.32
Legal charges	3.24	3.24	3.73
Audit fees	1.30	1.30	1.43
ED u/s 3 (i) of KED Act	28.34	21.32	27.68
Other Admin & Gen charges	29.03	30.48	33.53
Total	66.40	60.84	71.74

In view of the Board's policy of maximizing the utilization of own buildings and premises, and no additional taxes being expected, the expenses on account of rents, rates and taxes are projected to remain at the same level as in 2001-02 at Rs 3.06 crores per year during 2002-03 and 2003-04.

The Board is required to insure a considerable portion of its assets. The insurance expense was 0.04% of the opening gross block of assets in 2001-02. Using the same basis, the expense on this head is expected to increase in 2003-04. It has been projected at Rs. 2.32 crores during 2003-04.

Considering the number of pending cases in various courts and the change in the financial-legal environment of the sector, Legal Charges are expected to rise in future. While exact pattern and trend is difficult to project for this kind of expenses, it is expected to increase by 15% during the year 2003-04. This results in an estimate of Rs. 3.24 crores in 2002-03 (same level as 2001-02) and Rs. 3.73 crores in 2003-04.

The audit fees for 2003-04 are expected to increase by 10% over the estimated 2002-03 level of Rs. 1.3 Cr. This would result in an audit fee of Rs. 1.43 Cr. in 2003-04.

A significant part of the total Administration and General expenses is the Electricity Duty u/s 3 (i) of the KED Act. The Electricity Duty under this Act is paid by the Board at Rs 0.06 per

unit of net energy sold to end consumers paying more than 12 paise per kWh. The gross generation is reduced by the auxiliary consumption, T&D loss in KSEB system and the sale to licensees and non-paying group of consumers to compute the units of energy on which duty is to be paid. The projected cost on this account is arrived at from the projected units of energy computed for 2002-03 and 2003-04. The expense comes to Rs. 21.32 crores for 2002-03 and Rs. 27.68 crores in 2003-04.

The rest of the administration and general expenses have been grouped together as “Other Administration and General charges and is projected to grow at 10% over the estimated level of Rs. 30.48 Cr. in 2002-03. This is projected at Rs. 33.53 crores in 2003-04.

The amount of A&G costs to be capitalized has been estimated on the basis of the past trends and the projected A&G costs for the ensuing year as most of the construction work of the Board is carried out on turnkey basis where these costs are already included in the project cost. The underlying assumption is that the same set of people and same administrative set up of the Board would be used for construction work and therefore the related cost would follow the overall trend for the Board.

2.1.4. Repairs and Maintenance (R&M) Expenses

R&M expenses are a function of the assets of the Board. The table below shows the expense on this account for each asset class projected for the year 2003-04 as well as the estimates for previous years. The R&M cost is calculated on the basis of average R&M expenditure as % of opening gross block of assets for the past three years for each of the asset classes shown. Further, the variable cost of hydel and wind generation is deducted from the projected R&M cost of plants & machinery as these costs are shown separately for FY 2003-04.

Table 20. Repairs and Maintenance Expenses (Rs. Cr)

R&M Expense on	2001-02	2002-03	2003-04	Adjustment for Hydel & Wind generation	Adjusted R&M Cost
	(Provisional)	(Estimate)	(Projection)	(Projection)	(Projection)
Buildings	2.30	1.57	3.27		3.27
Hydraulic Works	1.36	0.89	1.85		1.85
Other Civil Works	3.11	2.67	5.54		5.54
Plant and Machinery	16.19	11.73	44.16	(19.82)	24.35
Lines, Cable Network, etc.	44.05	30.59	63.47		63.47
Vehicles	3.02	1.67	3.47		3.47
Furnitures and Fixtures	0.10	0.14	0.29		0.29
Office Equipments	0.18	0.14	0.30		0.30
Total	70.32	49.41	122.35	(19.82)	102.53

Following table provides R&M expenses as percentage of opening balance of the respective asset classes for three years in the past.

Table 21. R&M Expenses as a Percentage of Opening Balance of Gross Block⁶

⁶ Table 24 provides the details of Gross Block

Kerala State Electricity Board

Particulars	1999-00	2000-01	2001-02	Average of 3 years
R&M expense as % of Opening Balance of Gross Block				
Buildings	0.9%	1.2%	0.9%	1.0%
Hydraulic Works	0.3%	0.3%	0.2%	0.3%
Other Civil Works	6.6%	5.6%	4.5%	5.6%
Plant and Machinery	1.8%	2.1%	1.2%	1.7%
Lines, Cable Network, etc.	3.3%	3.7%	3.1%	3.4%
Vehicles	33.3%	30.4%	27.0%	30.2%
Furniture and Fixtures	1.4%	6.1%	1.2%	2.9%
Office Equipments	3.5%	4.3%	2.7%	3.5%
Total	2.3%	2.5%	1.9%	2.2%

It is observed that during the year 2001-02, this expenditure has declined. This is primarily because of a severe funds crunch and liquidity problems on account of (i) Non-payment of Government subsidies; ii) KSEB's prevailing tariffs not being enough to meet the Board's expenses in the year. It is critical to maintain the aging assets of the Board and any reduction in this expenditure may result in deterioration of the existing assets and increased costs in the later years.

On a conservative basis, an average of the three years (1999-00 to 2001-02) has been adopted (though the expenditure in 2001-02 and 2002-03 shows a lower level primarily on account of paucity of funds) for projecting R&M expense during 2003-04. For 2002-03, this cost is estimated at Rs.49.41 Cr. based on the information from preliminary accounts under preparation. For the ensuing year, the Board intends to target an R&M expenditure program costing Rs. 102.53 crores. This amounts to about 1.8% of the opening balance of gross fixed assets.

2.1.5. Provision for Doubtful Debts

As per Rule 4.2 of Annexe V of Electricity (Supply) (Annual Accounts) Rules, 1985, which governs the accounting policy of all the SEBs in the country, a fixed percentage of dues from consumers shall be maintained as a provision for meeting debts that turn bad. The existing receivables level of the Board is high and a significant part is locked due to litigation and government departments. Considering this and taking into account the current level of collection, the Board proposes to provide for bad and doubtful debts at 5% of the total receivables (net of provisions) at the beginning of the year. The Board proposes that this amount be allowed as expenditure for the year.

For the year 2003-04, the Board estimates a provision for doubtful debts of Rs. 43.58 Cr., which is 5% of the estimated total receivables (net of provisions) at the beginning of the year.

2.2 Capital Related Expenses

2.2.1. Depreciation

As per Rule 2.60 of Annexure III to Electricity (Supply) (Annual Accounts) Rules, 1985, the depreciation is to be charged by the straight-line method on the original cost of fixed assets in use at the beginning of the year.

2.2.1.1 Original Cost of Fixed Assets

The Original Cost of Fixed Assets at the beginning of FY 2002-03 is Rs. 4788.67 Cr. The Original Cost of Fixed Assets at the beginning of FY 2003-04 has been estimated by adding the “amount of CWIP transferred to fixed assets” during 2002-03.

2.2.1.2 Capital Works in Progress (CWIP)

The Board has a total capital expenditure outlay of Rs. 348.6 Cr. in 2002-03 and expected outlay of Rs. 500 Cr. in 2003-04. These are the base expenditures without the capitalized interest and expenses. The basis of computation of IDC and expenses capitalized are provided subsequently in this section. Table 22 provides a summary of the CWIP projections for the ensuing year as well as for the previous years:

Table 22. Capital Works in Progress (CWIP) (in Rs. Cr)

Particulars	2001-02 (Provisional)	2002-03 (Estimate)	2003-04 (Projection)
Opening Balance CWIP	2,215.35	1,849.68	1,462.10
Total Capital Expenditure	581.50	626.44	773.98
Base Investment	327.81	348.56	500.00
Interest Capitalized	128.87	145.72	122.05
Expenses Capitalized	124.82	132.15	151.93
Capitalized (Transferred) to Fixed Asset	947.17	1,014.01	924.28
Closing Balance CWIP	1,849.68	1,462.10	1,311.80

As can be seen from the above table, the total transfers to fixed assets during the current and ensuing year are expected as Rs. 1014.01 Cr. and Rs. 924.28 Cr respectively.

The total transfer to fixed asset is added to different asset classes (as per Schedule-19 to the annual accounts) based on past addition to each asset class. The tables below provide the proportion of total addition to assets (“CWIP capitalised to fixed asset”) to be added to each asset class and the average depreciation rates adopted for each of the asset class.

Table 23. Addition to assets classes

Land and Land Rights	1.9%
Buildings	4.8%
Hydraulic Works	6.5%
Other Civil Works	1.8%
Plant and Machinery	56.7%
Lines, Cable Network, etc.	27.9%
Vehicles	0.0%
Furniture and Fixtures	0.1%
Office Equipments	0.1%
Total	100%

Applying the above rates to the “CWIP transferred to fixed assets”, the following table provides the asset class-wise Original Cost of Fixed Assets at the beginning of the year for FY 2002-03 and 2003-04 (estimate).

Table 24. Original Cost of Fixed Assets at the Beginning of the Financial Year

Asset Class	(Rs. Cr)	
	2002-03 (Estimate)	2003-04) (Projection)
Land and Land Rights	150.80	170.51
Buildings	289.91	338.97
Hydraulic Works	617.23	683.01
Other Civil Works	80.87	99.31
Plant and Machinery	2,016.65	2,591.69
Lines, Cable Network, etc.	1,606.08	1,889.29
Vehicles	11.20	11.48
Furniture and Fixtures	8.75	9.94
Office Equipments	7.19	8.49
Total	4,788.67	5,802.68

2.2.1.3 Depreciation Rate

The asset classes shown above are as per the classification in Schedule-19 to Annual Accounts. The rates of depreciation for each of these asset classes are taken as the average rate of depreciation for the FY 2001-02 for the respective asset classes (based on depreciation during the year and the Original Cost of Fixed Assets at the beginning of the year).

Based on this, the asset class-wise average rate of depreciation and the amount of depreciation for FY 2002-03 and 2003-04 is shown in the Table 25.

Table 25. Depreciation Rate and Depreciation

Particulars	Depreciation rates	2002-03	2003-04
	%	Rs. Cr	Rs. Cr
Land and Land Rights	0.00%	-	-
Buildings	4.36%	12.65	14.79
Hydraulic Works	2.34%	14.44	15.98
Other Civil Works	2.39%	1.93	2.38
Plant and Machinery	6.63%	133.73	171.87
Lines, Cable Network, etc.	6.79%	109.08	128.32
Vehicles	1.73%	0.19	0.20
Furniture and Fixtures	0.85%	0.07	0.08
Office Equipments	10.61%	0.76	0.90
Total		272.88	334.52

As can be seen from the above table, the total depreciation amount to be included in the ARR projection for FY 2003-04 is Rs. 334.52 Cr. It may be observed that the average depreciation rate for Vehicles is very low compared to the notified rate. This is on account of very few numbers of vehicles existing, which attract depreciation. As a policy the Board has stopped purchasing new vehicles and opted for hired vehicles as and when necessary.

2.2.2. Interest and Finance Charges

The following table provides the interest and finance charges projected for the years 2002-03 and 2003-04.

Table 26. Interest and Finance Charges (in Rs. Cr)

Interest during the year on	FY2003	FY2004
Existing Loans as on March 31, 2003	300.82	299.08
Existing Bonds as on March 31, 2003	292.01	276.89
Loans from GoK as on March 31, 2003	0.51	6.11
Borrowings for Capex	-	37.07
Cash Credit for Working Capital	4.94	12.95
Borrowings for revenue deficit	-	8.55
Loans to finance Regulatory Asset	-	22.15
Other finance charges	78.34	78.88
Total	676.62	741.69

The interests on “Existing Loans”, “Existing Bonds” and “Loans from GoK” are based on the actual outstanding loan position as on March 31, 2003. The interest on “Loans for Capex” is determined based on the projected loans for 2003-04 at an average of 11% per annum interest rate. The interest on “Cash Credit for Working Capital” for 2002-03 is based on the provisional information available from the accounts under preparation. For 2003-04, the estimate is based on the projected requirement of additional cash credit for 2003-04 and the estimated outstanding amount at the beginning of the year. An average interest rate of 11.5% per annum has been adopted for projection purpose.

For the ensuing year, a total borrowing of Rs. 1207.99 Cr. is projected. The balances for existing loans and projected loans are shown separately. The total outstanding loans at the beginning of FY 2003-04 were Rs. 4901.99 Cr. Repayment during the ensuing year is projected to be Rs. 868.68 Cr., leaving a balance of Rs. 5241.31 Cr. as outstanding position at the end of FY 2003-04. This is without the outstanding amounts on cash credit facility allowed by the Board. Following table summarizes the outstanding loan position of the Board at the end of the year 2002-03 and projection for the year 2003-04.

Table 27. Outstanding Loan Position of the Board

(Rs. Cr)

Loan Agency (Source of loan)	Balance as on March 31, 2003	Additions during 2003-04	Redemption during the year	Balance as on March 31, 2004
KSE Bond	83.60	0.00	10.45	73.15
Non-SLR Bonds	2018.25	0.00	270.21	1748.05
Loan from IDBI	285.29	0.00	84.25	201.04

Kerala State Electricity Board

Loan Agency (Source of loan)	Balance as on March 31, 2003	Additions during 2003-04	Redemption during the year	Balance as on March 31, 2004
Loan from SIDBI	15.97	0.00	6.36	9.61
SIDBI - Direct	0.00	0.00	0.00	0.00
IDBI - Direct	0.00	0.00	0.00	0.00
Loan from LIC	197.93	0.00	21.41	176.52
Loan from HDFC	1.04	0.00	0.76	0.28
" Can Fin Homes	4.37	0.00	1.60	2.77
Medium-Term Loan	0.00	0.00	0.00	0.00
MTLoan - Kozhikode	87.50	0.00	12.50	75.00
Loan from REC	1019.95	0.00	142.03	877.92
REC - OECF	19.18	0.00	2.74	16.44
Loan under RE Scheme	41.45	0.00	20.22	21.22
Loan from PFC	118.82	0.00	15.24	103.58
Loan from KPFC	269.99	0.00	26.78	243.21
REC - STL	350.82	0.00	207.89	142.93
Sub-Total	4514.16	0.00	822.43	3691.72
Foreign Loan				
EDC Loan-Kuttiadi	59.62	0.00	10.39	49.24
EDC Loan-PSP	141.08	0.00	20.15	120.92
Credit Lyonnais	133.98	0.00	15.70	118.27
Sub-Total	334.68	0.00	46.24	288.43
Additional Loans				
Identified loan for Capex	0.00	0.00	0.00	0.00
Loans from GoK	53.16	0.00	0.00	53.16
Borrowing for Capex	0.00	673.98	0.00	673.98
Borrowing for Rev Def	0.00	148.75	0.00	148.75
Loans to finance Regulatory Asset	0.00	385.26	0.00	385.26
Sub-Total	53.16	1207.99	0.00	1261.15
Grand Total	4901.99	1207.99	868.68	5241.31

The interest on the outstanding loans of the Board (as on March 31, 2004) has been projected on the basis of following principles:

- Loans are assumed to be drawn and repayments made equally over a year
- In view of the above, interests are computed on the average balance of the loans except for the known loan repayment schedule of the existing loans and bonds
- New Loans for Capital Expenditure are assumed to be available at 11% per annum.

2.2.2.1 Other Interest and Finance Charges

These include items appearing as finance charges and other debits in Schedules 12 of the Board's Statement of Accounts. The key elements and the estimates / projections are provided below:

Table 28. Other Interest and Finance Charges

Particulars	2001-02	2002-03	2003-04
	Rs. Cr	Rs. Cr	Rs. Cr
Discount to consumers for timely/advance payment of bills	2.82	2.82	2.82
Interest on contributory Provident fund	0.00	0.00	0.00
Interest on General Provident Fund	34.16	42.45	47.20
Other Interest	0.81	-	-
Cost of Raising Finance	6.12	10.38	6.17
Other Charges	20.84	22.69	22.69
Total	64.75	78.34	78.88

During 2002-03 and 2003-04, the discount to consumers for timely/advance payment of bills is estimated to remain at the same level as during 2001-02. Interest on General Provident Fund has been provided at the rate of 9.5% per annum on the average balance during the year. Considering that Rs. 50 Cr. is assumed to be the net addition to the GPF fund in 2002-03 and Rs. 50 Cr. in 2003-04, the interest on the average balances during these years are computed at Rs 42.45 Cr. and Rs. 47.20 Cr. respectively.

The Cost of Raising Finance has been taken as 0.75% of the new loans drawn during the year and is estimated at Rs. 5.89 Cr. for FY 2003-04. For 2002-03, the estimate of Rs. 10.38 crores is based on the provisional information as per Board's accounts.

Similarly other charges of Rs. 22.69 crores during 2002-03 is estimated based on the provisional information as per Board's accounts. It is projected to remain at the same level during 2003-04.

The total estimate for "Other Financing Charges" during 2002-03 is Rs 78.34 crores and the projection for 2003-04 amounts to Rs. 78.88 crores.

2.2.2.2 Interest and Finance Charges Capitalized

The computation of Interest During Construction (IDC) for capitalizing to the cost of fixed assets has been done on the basis of four key assumptions:

- Interest is payable on the debt funded component of the Capital Works in Progress (CWIP), i.e., the unfinished work
- The IDC is computed on the average CWIP balance during each year
- A notional debt: equity funding of 80:20 has been assumed for the CWIP for the specific purpose of computing IDC
- The same interest rate of 11% for new loans for capital expenditure has been assumed for the purpose of IDC computation.

On the above basis, the Interest and Finance Charges Capitalised have been computed for the current and ensuing years and is shown in Table 22. These amounts are charged to capital account while the rest of the interest is charged to the revenue account as expenses.

2.2.3. Other Expenses Capitalised

As per the accounting rules, the expenses towards bringing an asset towards operations are to be added to the cost of the assets. This is the principle on which interest during construction (IDC) is capitalized (as explained above) and other expenses like Employee Cost and Administration and General Expenses towards the project are capitalized. As the construction work of the Board is carried out either on Turn-key basis where these costs are already included in the project cost or departmentally by the same set of people, the expenses capitalized is expected to be linked with the “Employee Expenses” and “Other Administration and General Expenses”. Therefore the combined growth rate of these two expenses has been taken for projecting the “Expenses Capitalised” head. The estimates and projections for the current year are shown in Table 22 above.

2.2.4. Statutory Surplus

The statutory surplus has been calculated as per provisions of section 59 of the Electricity (Supply) Act, 1948. The table below shows the computation of the statutory surplus.

Table 29. Statutory Surplus (in Rs. Cr)

Particulars at the Beginning of FY	2002-03	2003-04
Original Cost of Fixed Assets (A)	4,788.67	5,802.68
Less: Accumulated Depreciation (B)	1,225.32	1,498.19
Net Block (C=A-B)	3,563.35	4,304.49
Contributions, Grants and Subsidies towards cost of Capital Assets (D)	870.75	996.00
Net Fixed Asset (E= C-D)	2,692.61	3,308.50
Rate of Return Under Sec. 59 (F) (% of Net Fixed Asset)	3%	3%
Statutory Surplus (G=Fx E)	80.78	99.25

It may be noted that the statutory surplus prescribed in the ESA is a floor and not a ceiling. However, considering the impact of a higher surplus on the revenue requirement and hence on tariffs or subsidy, for the year 2003-04 the Board proposes the minimum 3% return on net fixed assets.

3. REVENUE FROM CURRENT TARIFFS AND PROPOSAL TO BRIDGE REVENUE GAP

3.1 Estimated Revenue Requirement and Revenue Gap

The following table provides a summary of revenue requirement from tariff for the previous year, current year and ensuing year:

Table 30. Revenue Requirement and Revenue Gap at Current Tariff (Rs. Cr)

Particulars	2001-02	2002-03	2003-04
Gross Revenue Requirement (a)	3,358.29	3,684.16	3,825.57
Less: Non-tariff Income (b)	95.86	186.00	200.00
Revenue Requirement from Tariff (c=a-b)	3,262.43	3,498.16	3,625.57
Revenue at Current Tariff (d)	1,946.00	2,393.67	2,683.86
Revenue Gap (e=c-d)	1,316.43	1,104.49	941.71

The computation of ARR has already been discussed in Section 2. The projection of non-tariff income and revenue from current tariff is discussed below.

As shown in the above table, the uncovered revenue gap for the ensuing year is Rs. 941.71 Cr. The Board proposes to recover this gap through a combination of subsidy support from the government and creation of a Regulatory Asset (discussed in subsequent sub-sections) to postpone recovery of a part of the revenue requirement.

3.1.1. Non-tariff Income

The Board has estimated a non-tariff income of Rs. 186 Cr. in 2002-03 and projected an income of Rs. 200 Cr. in 2003-04 from these sources. This projection is based on past trend and also includes the impact of recently introduced meter rent.

3.1.2. Revenue from current tariff

For the year 2001-02, revenue from tariff is as per the provisional accounts for the year. For the year 2002-03 the revenue is computed taking into account the pre-October 2002 tariffs and the current tariffs (revised in October 2002). For the projection year 2003-04, revenue from current tariff is computed from the projected sale of energy during 2003-04 to various consumer categories and the existing tariffs applicable to them.

Table 31. Revenue from Sale of Energy

Year	2001-02		2002-03		2003-04	
	Sale of Energy (MU)	Revenue from Tariff (Rs. Cr)	Sale of Energy (MU)	Revenue from Tariff (Rs. Cr)	Sale of Energy (MU)	Revenue from Tariff (Rs. Cr)
Domestic	3,699	404.78	3,720	498.15	3,946	598.30
Commercial	796	466.81	800	518.62	852	582.79
Industry LT	665	228.54	669	265.42	700	294.96
HT&EHT	2,946	758.83	2,948	1,012.27	2,962	1,093.27
Public Lighting	151	23.04	151	23.18	166.60	25.49
Railways	47	8.38	47	14.92	50	16.88
LT Agriculture	177	16.90	177	16.74	199	18.43
Licensees	176	32.18	183	44.37	193	53.73
Inter state	-	6.52	-	-	-	-
NPG	11	-	11		11	
Total	8,668	1,946.00	8,707	2,393.67	9,080	2,683.86

The detailed tariff category-wise computation for the projected year 2003-04 is provided in the attached data formats. Consumer category-wise load and energy consumption projections are discussed in detail in Appendix A.

3.2 Board's Proposal to Cover the Revenue Gap for FY 2003-04

The projected revenue gap for the ensuing year is Rs. 941.71 Cr. Even if a tariff revision is made effective from the beginning of the year, an average tariff increase of about 35% would be required to meet this gap fully through tariff.

The Board's intention is to minimize the rate shock to consumers and to maintain a smooth tariff trajectory while complying with the provisions of Section 59 of ESA. In the last two years the tariffs have been increased twice to reduce the ever-increasing gap between cost and revenue. With the intention to avoid increasing tariffs for the third consecutive year, it is proposed to meet the gap through a combination of expected subsidy support from Government and by forming a Regulatory Asset. The Regulatory Asset is to be amortised in the subsequent years and the associated financing cost is to be allowed to be included in the revenue requirements during that period as legitimate business expenditure.

The root cause of revenue gap lies in the huge liability of the Board in servicing its debts. More than Rs. 135 crores per month was required for the year 2002-03 towards debt servicing and the amount is projected to be over Rs.125 crores per month for 2003-04. This huge debt servicing obligation makes the financial position of the Board highly vulnerable.

The main reason for the accumulation of debt is the non-receipt of amount spent under Rural Electrification, non-receipt of subsidy to enable the Board to earn the statutory 3% RoR, non-receipt of subsidy for pre-1992 tariffs under the Industrial Policy announced by the Government in 1992 and wide gap between the cost and tariff per unit of power. Tariff in the past was fixed far below the cost to subsidise the consumers. Board did not receive the funds on these accounts from the Government. If the payments on these accounts were made in time the Board's financial condition wouldn't have come to such a pass.

The following table shows the extent of dues payable by the State Government to the Board:

Table 32. Subsidy receivable

Year	Opening Balance	Subsidy on account of Pre-92 tariffs to industries	Additional subsidy to attain statutory 3% RoR	Total Revenue Subsidy Due during the year	Subsidy received/adjusted	Closing Balance
	Rs. Cr	Rs. Cr		Rs. Cr	Rs. Cr	Rs. Cr
1995-96	25.68	17.97	40.52	58.49	-	84.17
1996-97	84.17	18.25	259.76	278.01	25.00	337.18
1997-98	337.18	31.61	289.68	321.29	-	658.47
1998-99	658.47	50.07	251.83	301.90	-	960.37
1999-00	960.37	88.98	243.39	332.37	-	1,292.74
2000-01	1,292.74	86.36	1,186.48	1,272.84	-	2,565.58
2001-02*	2,565.58	76.75	1,239.70	1,316.45	2,222.30	1,659.73
2002-03 @	1,659.73			1,104.49	200.00	2,564.21

* Adjustment of Rs 7.57 crores was made during the year and further adjustment of Rs 2214.73 crores (Table 33) was notified in October 2002.

@ Adjustments of Rs. 200 crores was notified (Table 34) on March 31, 2003

The following tables show the adjustments made during 2001-02 and 2002-03:

Table 33. Adjustments of dues of Rs 2214.73 crores

Particulars	Amount (Rs. Cr)
Electricity Duty Payable	579.33
Guarantee Commission	15.2
State Government Loans Outstanding	199.89
Interest payable on govt. Loan	247.8
Total Dues to Govt.	1042.22
Securitisation of the dues to CPSUs	1172.51
Total	2214.73

The above adjustment was notified vide **G.O. (MS) No. 25/02/PD dated 09/10/2002**. Further adjustment of Rs. 200 crores was notified vide G.O. (Rt) No. 3706/03/Fin dtd. 31/03/2003 against the following items:

Table 34. Adjustments of dues of Rs 200 crores

Particulars	Amount (Rs. Cr)
Taxes on consumption and sale of Electricity	179
Surcharge	6
Guarantee Commission	15
Total	200

It may be seen from the above that all dues to government including the electricity duty, guarantee commission, etc. till 31.3.2003 have been realised by government from the Board. The entire outstanding loan and its interest upto 31-03-2002 have also been netted off. But the amounts due to the Board on account of subsidy, etc. continue to increase.

In addition to the estimated amount of Rs. 2564.21 crores due (as on March 31, 2003) from the Government on account of revenue deficit, a further amount of Rs. 1801.1 crores is due to the Board as on March 31, 2002 on account of RE Subsidy. The following table provides the details:

Table 35. Dues On account of RE Subsidy

Year	Amount Due	Amount Received	Closing Balance
	Rs. Crore	Rs. Crore	Rs. Crore
Opening Balance	79.28		
1990-91	38.89	0.00	118.17
1991-92	48.31	0.00	166.48
1992-93	23.92	0.00	190.40
1993-94	38.29	0.00	228.69
1994-95	27.61	0.00	256.30
1995-96	79.80	0.00	336.10
1996-97	155.58	0.00	491.68
1997-98	205.59	0.00	697.27
1998-99	220.84	0.00	918.11
1999-00	296.87	0.00	1214.98
2000-01	305.59	0.00	1520.57
2001-02	280.53	0.00	1801.10

In the past, Government used to give exemption from electricity duty under section 3 (i) of the Kerala Electricity Duty Act as and when the Board was in acute financial crisis. Such exemption from payment of Electricity Duty u/s 3(i) of KED Act was granted in public interest for a period of five years with effect from April 1, 1989 vide Notification No. 8763/A1/90/PD dated 13th September 1991. A relevant quote from the Explanatory Note (not part of the notification) to this notification provides the background of imposition of this duty and the reasons for exemption – “*The Kerala Electricity Duty Act, 1963 was sought to be imposed when it was envisaged that the then prevalent tariff was substantially high and the profits made by the Kerala State Electricity Board has to be mopped up to augment the resources of the State. But the parameters for changing the duty, i.e. sale price of power have not been changed with the rise in cost. The working group appointed by the Central Electricity Authority to study and suggest the improvements in the financial performance of the Board has recommended that all Electricity Duty under all Sections should be part of the tariff and should be allowed to be retained by the Electricity Board so that the Board will be able to generate adequate resources for financing its capital schemes.The State Government has recently announced that the economically backward consumers using less than 20 units per month would be exempted from payment of electricity charges. In order to meet this social obligation, Kerala State Electricity Board would have to bear additional liability also. Government have considered these aspects in detail and decided to exempt Kerala State Electricity Board from payment of Electricity Duty to the State Government under section 3 (i) of the Kerala Electricity Duty Act, 1963 for a period of 5 years from 1st April 1989.*”

The above period was further extended in the public interest for a period of one year with effect from April 1, 1994, vide G.O. (Ms) No. 1/97/PD dated 2nd January 1997.

The above clearly shows that the Government acted in public interest and exempted the Board from paying the Electricity Duty u/s 3 (i) to enable it to earn a return to fund capital expenditure. This was followed even when the Board was incurring a much lower revenue deficit during those years as seen from the subsidy requirements shown below:

Table 36. Subsidy requirements during 1989-90 to 1994-95

Year	Subsidy during the year (Rs. Cr)
1989-90	0.10
1990-91	0.03
1991-92	1.56
1992-93	0.02
1993-94	-
1994-95	8.56

In subsequent years this facility was not extended and the Electricity Duty was treated as payable by the Board, to the State Government.

Recently the Government has notified adjustment of these dues against the subsidy receivable from the Government. With the huge revenue deficit during the year 2002-03 and expected during 2003-04, the Board anticipates that the Government would exempt KSEB from paying the electricity duty u/s 3(i) of Kerala Electricity Duty Act in line with the practice adopted during the years 1989 to 1995.

The Board also collects electricity duty under section 4 of the above Act from the consumers and it has to be remitted to the Government as per the provisions of the Act. In view of the acute financial crisis being faced by the Board, the Board anticipates that the government would allow this amount to be retained by the Board (in line with the earlier recommendation by CEA, GoI) as grant with effect from April 1, 2002. The Board should be allowed to retain this amount as grant from the GoK. If the Government does not grant this request, at least it should be adjusted only against the subsidy payable by the Government (shown as receivable in the Board's account, in Table 32 & Table 35), till all the dues are fully adjusted.

During 2002-03 and 2003-04 amounts of Rs.200 crores and Rs. 175 crores respectively have been provided as part of ADB loan for structural adjustment towards reducing the revenue deficit of the Board. The Board anticipates that this fund would be passed on to KSEB in cash.

In addition to the issue of non-payment of subsidy by the Government in cash, the Board also faces a severe problem of subsidised tariff rates in general and highly subsidised tariff rates for some of the consumer categories. The following table provides the extent of subsidised tariffs extended to various consumer groups (projected for 2003-04):

Table 37. Subsidy and Cross-Subsidy

Consumer Categories	Energy Sold	Revenue at existing tariff	Total Cost of Service	Surplus over cost	Shortage against cost
	MU	Rs. Cr	Rs. Cr	Rs. Cr	Rs. Cr
Domestic LT-I	3942	596.02	1,574.01		978.23
LT-I (b)	1	0.17	0.28		0.11
Colony LT-II	4	2.11	1.49	0.62	
Industrial LT-IV	700	294.96	279.33	15.63	
Irrigation & Dewatering LT-V	199	18.43	79.52		61.08
Non-Domestic LT-VI	233	153.89	93.14	60.74	
Commercial LT-VII	618	428.83	246.88	181.95	
Public Lighting	167	25.49	66.52		41.03
Sub-Total/Average LT	5863	1,519.91	2,341.17	259.18	1,080.45
Extra High Tension					
EHT Industries - 66KV	313	111.39	124.79		13.40
EHT Industries - 110 KV	1008	355.26	402.34		47.08
Railways	50	16.88	20.16		3.28
Sub-Total/Average EHT	1371	483.53	547.29		63.76
High-Tension Supply					
Industrial - HT I	1325	482.93	529.14		46.21
Non-Industrial - HT II	89	40.80	35.64	5.16	
Agriculture - HTIII	6	2.32	2.56		0.24
Commercial - HTIV	219	99.81	87.27	12.53	
Seasonal - HTV	3	0.84	1.15		0.32
Sub-Total/Average HT	1642	626.69	655.77	17.69	46.77
Bulk Supply	193	53.73	76.90		23.17
Total	9069	2,683.86	3,621.13	276.88	1,214.15
NPG	11		4.44		4.44
Grand Total	9080	2,683.86	3,625.57	276.88	1,218.59
Overall Deficit					941.71

Section 29(5) of the ERC Act (1998) provides that

“.....If the State Government requires the grant of any subsidy to any consumer or class of consumers in the tariff determined by the State Commission under this section, the State Government shall pay the amount to compensate the person affected by the grant of subsidy in the manner the State Commission may direct.....”

It has been assessed that the difference between the average cost of supply and the revenue from tariff is about Rs. 716 crores for providing first 40 units of energy to all domestic consumers at the heavily subsidised rate of Rs 1.15 per unit. The details are shown below:

Table 38. Deficit on account of highly subsidised domestic rates for the first 40 units consumption per month

Total No. of consumers	Consumption for all consumers at 0-40 units slab rate	Average cost of supply	Tariff rate for 0-40 slab	Difference	Total subsidy amount
Nos.	MU	Rs/kWh	Rs/kWh	Rs/kWh	Rs. Cr
5485252	2,519.82	3.99	1.15	2.84	716.12

The detailed consumer category-wise assessment of deficit or surplus revenue with respect to average cost of supply is also provided in Data Format 20 submitted with this application.

Similarly, on account providing energy at heavily subsidised rates to agricultural consumers, a revenue deficit of about Rs. 61 crores is assessed and an amount of about Rs. 4 crores is assessed for supply to Non-paying group of domestic consumers (with monthly consumption below 20 kWh). These are only the major areas where heavily subsidised tariffs are prevailing.

Out of the deficit caused on account of these heavily subsidised rates, the non-domestic and commercial consumers provide about Rs. 243 crores by way of cross-subsidy (average tariffs being higher than average cost of supply). The Board requests the Hon. Commission to allow the continuation of existing rates for these consumers so that the above cross-subsidy is available for 2003-04. If this request of the Board is granted, the balance amount of revenue deficit on account of heavily subsidised tariffs will be about Rs. 538 crores (716+61+4-243). Out of this the Board proposed release of Rs. 175 crores of subsidy in cash, exempting payment of electricity duty u/s 3(i) of about Rs 28 crores and providing a grant of about Rs. 154 crores by adjusting against electricity duty u/s 4. This would still leave a balance of about Rs 180 crores just to meet the deficit on account of the heavily subsidised rates. The Board anticipates that the Government would release an additional amount of Rs. 200 crores in cash. Thus a total subsidy of about Rs. 557 crores can be mobilised to minimise the revenue gap without inflicting a “tariff shock” to the consumers.

The balance amount of about Rs. 385 crores (942 Cr – 557 Cr) is proposed to be carried forward as Regulatory Asset. The table below summarises the proposal of the Board to bridge the expected revenue gap of Rs. 941.71 crores for the year 2003-04:

Table 39. Revenue Requirement and Proposal to bridge the Revenue Gap

	Description	FY 2003-04
		(Rs. Cr)
a	Aggregate Revenue Requirement (including Statutory Surplus)	3825.57
b	Non-tariff Income	200.00
$c = a - b$	Net Revenue Requirement from Tariffs	3625.57
d	Revenue at Current Tariffs	2683.86
$e = c - d$	Revenue Gap	941.71
f	Revenue Gap proposed to be covered by Tariff increase	0.00
g	Exemption from paying ED u/s 3(i) of KED Act	27.68
h	Allowing the duty collected u/s 4 as a grant to the Board	153.78
i	Release of the budgetary provision in cash	175.00
j	Sanction of additional amount of subsidy in cash to offset the deficit caused by heavily subsidised group of consumers	200.00
$k = (g + h + i + j)$	Total subsidy grant expected from the GoK to partly cover the gap	556.46
$h = e - (f + k)$	Revenue Gap proposed to be covered by regulatory asset	385.25

With the above proposal to bridge the revenue gap, the Board requests the Hon. Commission to allow the Board to continue the existing tariff rates as per the following notifications (enclosed as Appendix D to this application):

1. B.O. (FM) No. 1462/02/TRAC/TO-1/2002, Dated 24th October 2002;
2. B.O. (CM) No. 1480/02 (TRAC/TO-1/2002), Dated 29th October 2002;
3. B.O (FM) No. 110/2003/TRAC/TO 1/2002 Dated 28.01.2003
4. B.O. (CM). No. 426/03 (TRAC/TO-1/2002), Dated 2nd April 2003;

The Hon. Commission may ascertain the views of the Government of Kerala and direct the Government as per the provisions of Section 29 (5) of the ERC Act, 1998 with regard to the proposals relating to exemption from electricity duty u/s 3(i), allowing the amount collected u/s 4 as grant to the Board or to adjust the same against subsidy payable to the Board; release of the budgetary provision of Rs. 175 crores in cash and reimbursement of Rs. 200 crores of net subsidy to heavily subsidised groups. In case the Government do not agree to the proposals, the Hon. Commission may be pleased to pass appropriate orders for regulating the tariffs of the subsidised consumer categories to compensate for the loss of revenue to the Board. In such an event, the Board may be given an opportunity to be heard and present its case.

The above proposal to meet the revenue gap would serve the dual purpose of the customers not being subject to a tariff increase for the third year in a row and at the same time the Board would be able to earn at a later date, its minimum statutory returns of 3% as prescribed in the Section 59 of the Electricity (Supply) Act, 1948.

4. LONG TERM ISSUES

4.1 Introduction

In addition to the ARR and Tariff Proposal for FY 2003-04, the Board also would like to submit certain proposals, which affect the Board's financial health and its ability to serve its consumers over a longer period. These proposals are based on:

- Principals and guidelines laid down in various legislation governing the Board's functioning;
- Sound commercial and economic principals;
- Practices followed by other utilities (including other SEBs) in the country; and
- Precedents set by other State Electricity Regulatory Commission in their orders.

The Board is proposing three concepts for the Hon. Commission's consideration:

Regulatory Assets to cover the uncovered revenue gap

Year end truing up of costs and revenues of the Board

Fuel and Other Cost Adjustments (FOCA) formula

4.2 Regulatory Asset

The Board submits to the Hon. Commission that the difference between the approved revenue required and the revenue from existing tariffs (proposed to be maintained during the year 2003-04) and subsidies from GoK be carried forward to the next year as "Regulatory Asset". The Board requests that this asset be amortized over a period of three years starting FY 2004-05 and the interest on financing this asset is allowed to be recovered through ARR as legitimate business expenditure.

Allowing postponement of recovery of revenue by treating this as regulatory asset has following advantages:

- Board's consumers are not subjected to a tariff shock due to the revenue gap being recovered by increased tariffs
- The GoK subsidy level is maintained at an affordable level for the government to pay the same in cash (unlike in the previous years where the total revenue gap, including the statutory return, used to be shown as subsidy in the revenue accounts while it was not being paid).
- Board being able to earn at a later date, its minimum statutory surplus of 3% as prescribed in the Section 59 of the Electricity (Supply) Act, 1948

The concept of regulatory asset has several precedents within the country. The next subsection provides the precedents set by a number of utilities and the regulatory commissions in the country accepting the concept of regulatory assets.

4.2.1. Precedents of the Proposed Mechanism

Various regulatory precedents exist in the country, wherein the utility has approached the regulatory commission with a proposal for regulatory assets. In a number of cases, regulatory commissions, based on the merit of the case have either permitted deferring a portion of the revenue gap as regulatory asset to be recovered in subsequent years or accepted the principle of regulatory asset for future. The regulators who have accepted the principle of regulatory assets include Orissa Electricity Regulatory Commission (OERC), Haryana Electricity Regulatory Commission (HERC), Andhra Pradesh Electricity Regulatory Commission (APERC) and Delhi Electricity Regulatory Commission (DERC). The list of utilities that have approached the commission with the proposal for regulatory assets is quite long and includes utilities in Tamil Nadu, Maharashtra, Haryana, Andhra Pradesh, Karnataka, etc.

The first case pertains to the state of Orissa. OERC in its tariff order of November 1998 allowed a portion of the revenue requirement to be deferred as a special category of capital (regulatory asset), while stating the following,

“.....we consider it pragmatic to treat the amount of difference between the revenue requirement calculated on the basis of Gridco's estimated T&D loss of 41% and the revenue requirement calculated on the basis of the reasonable level of 35% as has been determined by us as a special category of capital. This amount with RBI rate of interest will be considered for inclusion in the revenue requirement for tariff purposes”

HERC was also faced with the situation of Haryana Vidyut Prasaran Nigam Limited (HVPNL) not being able to recover its entire revenue gap in three months without a rate shock to the consumers. In its tariff order dated 22/12/2000, HERC permitted HVPNL to carry forward the revenue gap (calculated by assuming that the existing tariffs apply for nine months and new tariffs apply for three months) as a Regulatory Asset to be treated as a special item on the asset side of the balance sheet to the extent determined in its order. HERC allowed this gap to be funded with borrowing from approved institutions or from equity. Amortisation of the asset and the financing cost was envisaged to be included in subsequent ARR for the year 2001-02.

In Andhra Pradesh, APERC in its tariff order for the year 2001-02, while accepting the principal of regulatory assets, observed that

“...the concept of Regulatory Asset is however, much wider and includes a number of other things. For example, Regulatory Asset can be sought for to fill a deliberate uncovered revenue requirement gap of a year for one reason or the other (say apprehension of a tariff shock) with the idea of writing off the asset over a period. The concept of Regulatory Asset for such matters may require an order providing for deviation from Sixth Schedule. Creation of a Regulatory Asset for FY 2000-01 or FY 2001-02 as at present, does not arise as the revenue requirement of the licensee including the admissible part of previous year losses have been met by tariff or subsidy.

However, the Commission reiterates its willingness to consider creation of a Regulatory Asset in appropriate circumstances, as stated in Para 2.7 of the Tariff Order for FY 2000-01.....”

In Delhi, the DERC in its first tariff order accepted the principal of regulatory asset and stated that

“.....the ARR and expected revenue figures computed by the Commission are its best estimates. Therefore, Commission would conduct a year-end review of all the expenses and revenue of the utility for the year 2001-02 along with the next ARR filing and determine any

over or under recovery of allowable costs of DVB during the year. This ex-post review would also establish any uncovered revenue gap, which the Commission could permit the utility to carry forward as a regulatory asset – on which DVB might be permitted to earn a return equal to the cost of capital used to finance this asset.....”

Hence, the utilities as well regulators around the country have accepted the above mechanism as an effective tool to achieve the twin objectives of financial viability of the utility and protection of the consumer interest.

Consequently the Board requests the Commission to consider creation of a regulatory asset equal to the amount of uncovered revenue gap to be amortized over a three year period.

4.3 Year End Truing up of Costs and Revenues of the Board

The mechanism for reconciling the actual performance with the projections is crucial for the Board's financial health. In the ARR filing, the Board has made certain assumptions while projecting its operations for FY 2003-04. These projections are based upon the best estimates of the operations and prospective plans of the Board at the time of the filing. The actual performance would doubtless vary from the projections made. Not only a major part of the Board's costs are external to the organization but also there are several external factors (such as change in consumer mix, failure of monsoon) which can significantly impact the financial condition of the Board. The variations in actual outcome vis-à-vis projections could pose very significant risks to the Board. Hence, there is a need to have in place, an adequate mechanism for protecting the Board from such uncertainties, which the Board is exposed to.

In the environment in which the Board operates, such variations may arise due to several reasons. These variations may be on account of factors that are either external or internal to the operations of the Board. The variance can occur on account of increase in fuel and other variable costs, fixed cost changes due to exchange rate variation, cost escalation on account of non-availability of cheap hydro resources and increased marginal cost of purchases on account of high cost incremental purchases to meet higher than expected requirements of the consumers. As a utility with limited return, the Board must be insulated from the above changes through appropriate pass through mechanisms.

Apart from the changes outlined above that are external to the Board, there may be changes that are internal to the organisation. To cite an example, the Board is currently in the process of installing better measurement infrastructure. With better measures available, the actual measures of operations may be different compared to the previous ones. Also, in a regime of insufficient data and forecasting techniques, the actual performance may be different from forecasts.

To take care of such uncertainties in the its operation, the Board proposes that a comparison of the actual performance vis-à-vis the projection be done at the end of the year. Any deviations arising out of factors beyond the control of the Board be allowed to be recovered through tariff in subsequent years. This will also mean that if the deviations are negative (i.e. Board's expenses are less than projected or revenue is higher than projected), the difference will be allowed to be reduced from the ARR for the subsequent years).

This truing up mechanism has several advantages and also has a number of precedents.

- It adheres to the principals laid down in various legislation governing the power sector in the country:

- ⇒ It is in line with the philosophy of SEBs earning a return equal to the statutory surplus of minimum 3% on net fixed assets as prescribed in Section 59 of ESA. In case, there is no such mechanism, the Board might end up making lower return.
- ⇒ Schedule VI of ESA, which applies to the licensees, provides for truing up of licensees' costs and revenues at the end of the year through the mechanism of "tariff and dividend control reserves".

- For a utility with regulated return, a truing up mechanism at the end of the year ensures that the utility earns the statutory allowed returns and is not exposed to uncontrollable risks.
- A number of regulatory commissions in the country have recognized this concept and approved in their tariff orders. For example, DERC in order stated that

*".....the ARR and expected revenue figures computed by the Commission are its best estimates. Therefore, Commission would **conduct a year-end review of all the expenses and revenue of the utility for the year 2001-02** along with the next ARR filing and determine any over or under recovery of allowable costs of DVB during the year. This ex-post review would also establish any uncovered revenue gap, which the Commission could permit the utility to carry forward as a regulatory asset – on which DVB might be permitted to earn a return equal to the cost of capital used to finance this asset....."*

Similarly APERC in its tariff order for FY 2001-02, allowed certain past losses which were considered to be beyond the control of the utility.

Thus, the Board proposes to the Hon. Commission to approve the concept of year-end truing-up of costs and revenues of the Board. It is proposed that factors beyond the control of the Board be identified and agreed upon as far as possible and deviations in costs and revenues on account of these factors be allowed at the end of the year.

4.4 Fuel and Other Cost Adjustments (FOCA) Formula

In spite of proposing the truing up mechanism, the Board wishes to draw the attention of the Hon. Commission that there are large cost elements where any major deviation during the year may lead to severe strain on the Board's liquidity position and its operations. These are typically cost increases arising out of fuel cost increases, changes in thermal-hydel mix owing to low availability of hydel power during a bad monsoon year, exchange rate variations, etc.

In this regard, the Board would request the Hon. Commission to allow it a pass-through mechanism for the cost elements that have the following characteristics:

- The amounts involved are significant;
- The changes are foreseeable but difficult to predict in magnitude;
- The quantum of the changes vis-à-vis the base levels are easily identifiable soon after the changes have happened; and
- The changes can be indexed to a base number and they do not significantly affect any other element of revenues or costs.

The Board draws the attention of the Hon. Commission to the monsoon failure in the year 2002-03. This necessitated higher drawal of expensive thermal power to substitute the unavailable hydel power. This resulted in the Board sustaining significant additional costs as

well as liquidity problems resulting from higher cash outgo for thermal power purchase. The Board had to borrow significant large sums to meet this liquidity problem which further deteriorated the Board's financial condition.

Most of the utilities in the country have some uncontrollable cost pass-through mechanism. Almost all SEBs and licensees in the country historically had a Fuel Cost Adjustment (FCA) formula which allowed automatic pass-through of any escalation in fuel costs through some indexing mechanism. Even central power utilities like NTPC has a FCA mechanism and the Board has been paying escalations on account of fuel cost increases, exchange rate variations, etc. to NTPC. Most of the regulatory commissions in the country, including Central Electricity Regulatory Commission (CERC) have approved such automatic pass-through formulae.

The Board would like to submit that it proposes to develop a comprehensive formula for Fuel and Other Cost Adjustments (FOCA) and submit it for the Hon. Commission's consideration in a separate application. Through this application, the Board requests the Hon. Commission to grant it permission to submit such a formula in a separate application.

APPENDIX A: LOAD AND DEMAND PROJECTIONS

This Appendix describes the total load and demand projections for the Board as well as consumer category-wise consumption details.

The following table summarizes the consumer category-wise consumption details and number of consumers.

Table 40. Consumption Details

Consumer Categories	Sales (MU)		No. of Consumers	
	2002-03	2003-04	2002-03	2003-04
	Estimate	Projection	Estimate	Projection
Domestic LT-I	3,716.93	3,942.65	5,275,265	5,485,858
Colony LT-II	3.52	3.73	500	500
Temporary Illumination LT-III	-	-	-	-
Industrial LT-IV	669.35	699.57	103,394	103,385
Irrigation & Dewatering LT-V	177.16	199.14	409,936	451,957
Non-Domestic LT-VI	219.16	233.27	977,449	1,031,512
Commercial LT-VII	580.88	618.29	-	-
Public Lighting	151.48	166.60	2,441	2,563
Sub-Total/Average LT	5,518.46	5,863.25	6,768,985	7,075,774
Extra High Tension				
Non-Power Intensive Industries - 66KV	309.37	312.53	37	36
Non-Power Intensive Industries - 110 KV	992.45	1,007.63	-	-
Power Intensive Industries - 66KV	-	-	-	-
Power Intensive Industries - 110KV	-	-	-	-
Railways	47.01	50.49	3	3
Sub-Total/Average EHT	1,348.83	1,370.65	40	39
High-Tension Supply				
Industrial - HT I	1,324.18	1,325.19	931	931
Non-Industrial - HT II	89.71	89.26	181	181
Agriculture - HTIII	6.54	6.42	44	44
Commercial - HTIV	222.69	218.57	497	497
Seasonal - HTV	2.94	2.89	-	-
Sub-Total/Average HT	1,646.06	1,642.31	1,653	1,653
Bulk Supply	182.60	192.58	7	7
Total	8,695.96	9,068.80	6,770,685	7,077,474
NPG	10.66	11.12	57,102	54,096
Grand Total	8,706.62	9,079.92	6,827,787	7,131,570

The following general approach has been followed.

The change in demand occurs due to i) change in number of consumers and ii) change in per capita consumption either due to change in connected load or change in utilization of the implements. These are broadly reflected in the consumption pattern or past trends. In KSEB's case, the under-reporting of T&D losses in the past resulted in distorted reporting of

consumption data. Therefore, the sales (energy) projection for 2003-04 takes into account the increase in consumer number and estimated changes in per capita consumption and also takes into account the recent trends in consumption by various consumer categories. Therefore, the sales projection is based more on empirical evidences rather than quantifiable trend analysis.

A.1 Load shedding assumption in demand estimation

The LDC personnel estimate the extent of load shedding. Load Shedding statistics are not pure data but also have an element of judgment, based on reports received from the field, by informed people who are in the best position to make such a judgment. Existing pattern of load shedding does not regularly affect the HT and EHT consumers. The major consumer categories affected by the regular load shedding are the domestic, commercial and public lighting. These consumers also do not have the ability to shift their load over time and the expected demand from this category during these hours may be taken as lost demand. Therefore, it is assumed that only a part of the total load shedding results in lost demand. A proportion corresponding to the share of these categories in total sales is added back to the restricted demand to obtain the unrestricted demand. Accordingly, for the period April 2003 to March 2004, 53.7% of load shed during 2002-03 is added back to obtain the representative load curves for each month from April 2003 to March 2004. This has been adopted as the sales forecast is primarily based on the per capita consumption, the growth in consumer number and the past trend in sales. This methodology tends to provide an estimate of restricted demand.

The unrestricted demand as determined above, is matched against the available power and the level of demand that can be satisfied with this power is determined. This provides the final sales projections for FY 2003-04 as shown in Table 40.

APPENDIX B: MERIT ORDER DESPATCH METHODOLOGY

The generation and power purchase expenses for the year 2003-04 have been estimated based on a simulation of merit order despatch. **The objective of the exercise is to minimize the power procurement cost, i.e. the cost of generation and power purchase.** The cost minimization is done considering the following principles.

B.1 Principles of Merit Order Despatch Methodology

1. The fixed costs of each plant (whether of power purchase or of own generation) are those costs which will be incurred by the Board irrespective of the extent of generation / power purchase from the plant. Since these costs of the Board are not dependent on actual level of generation, they should not be an input to the decision on the despatch schedule.
2. Therefore, the variable costs (i.e. costs whose impact on the Board is a function of the actual level of despatch of the plant) should be the determinant of the extent of despatch of each plant.
3. The extent of actual generation of any plant (its Plant Load Factor (PLF)) is dependent on the plant's capability to generate AND the system's requiring the plant to generate. Thus, the capability of each plant to generate, and the system demand at various times are independent inputs, and the PLF of each plant is the resultant output.
4. The system demand varies from hour to hour in a day. The demand also varies across seasons. Since energy cannot be stored, the determination of extent of despatch for each plant cannot be estimated based on the annual requirement of energy, but needs to factor in the time at which the energy is required.

The projection for generation and power purchase based on the merit order despatch methodology are prepared in following steps:

1. *Demand Schedule:* The first step is to project a representative daily load curve for each month of the ensuing year. Thus, based on the actual load curves for April 2002 to March 2003, representative load curves for each month from April 2002 to March 2003 have been prepared. The load in the first hour of the representative load curve for April 2002, for example, is the average of the actual loads during the first hour of each day of April 2002. Similarly, the load for each of the 24 hours of the representative load curve for April 2002 is calculated. The representative load curves for all months are calculated in this manner.

The output of this step is representative load curves for each month of the twelve-month period of the ensuing year. In projecting the representative load curves, it is assumed that the demand for each month would grow, but the shape of the load curve for each month will remain the same as for 2002-03.

Adjustment for Load Shedding: The daily load curve data also shows the load shedding during each hour, which is averaged to determine the load shedding in the representative load curves. As explained in the Appendix-A, a proportion of the load shedding is added back to the above load curve to obtain the unrestricted load curve. The following example for developing the representative load curve for the month of April 2003 explains the methodology adopted to obtain the representative load curve for each month.

Representative load curve for April 2002 – Each hour represents the average of demand recorded during that hour for all the days of April 2002.

Table 41. Example – Development of representative Unrestricted Demand Curve for a month

Period - April 2002								
Hour of the day	1	2	3	4	5	6	7	8
Met Demand (MW)	1343	1316	1283	1275	1333	1558	1441	1363
Hour of the day	9	10	11	12	13	14	15	16
Met Demand (MW)	1349	1370	1362	1390	1396	1416	1448	1407
Hour of the day	17	18	19	20	21	22	23	24
Met Demand (MW)	1370	1397	2000	2078	2038	1865	1595	1428
Period - April 2002								
Hour of the day	1	2	3	4	5	6	7	8
Load Shedding Estmt. (MW)	-	-	-	-	-	-	-	-
Hour of the day	9	10	11	12	13	14	15	16
Load Shedding Estmt. (MW)	-	-	-	-	-	-	-	-
Hour of the day	17	18	19	20	21	22	23	24
Load Shedding Estmt. (MW)	-	66	63	60	72	-	-	-
Proportion of Load shedding added to restricted demand				53.7%				
Period - April 2002								
Hour of the day	1	2	3	4	5	6	7	8
Unrestricted demand (MW)	1,343	1,316	1,283	1,275	1,333	1,558	1,441	1,363
Hour of the day	9	10	11	12	13	14	15	16
Unrestricted demand (MW)	1,349	1,370	1,362	1,390	1,396	1,416	1,448	1,407
Hour of the day	17	18	19	20	21	22	23	24
Unrestricted demand (MW)	1,370	1,433	2,034	2,110	2,076	1,865	1,595	1,428

2. *Availability Schedule*: This provides the maximum possible extent of generation from each plant servicing the load in Kerala, for each month of the ensuing year. The schedule adopted is as per the data provided by the respective generators. For projection of hydel power availability, the following factors were considered:

- *Reservoir balance as on April 1, 2003 equivalent to 740 MU of energy*
- *Expected inflow equivalent to 6140 MU, computed by adopting 10 year average inflow reduced by 6% to reflect the expected lower monsoon*

Kerala State Electricity Board

- The standard reservoir level on March 31, 2004, equivalent to 1250 MU based on past data

The following table shows the availability from sources other than hydel stations of KSEB

Table 42. Availability schedule 2003-04 (in MW)

Other Sources	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Wind - Kanjikode	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
BDPP	80.0	80.0	80.0	80.0	80.0	60.0	80.0	80.0	80.0	80.0	80.0	80.0
KDPP	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Ramagundam (Old)	212.4	179.5	179.5	179.5	212.4	179.5	234.9	234.9	234.9	234.9	234.9	233.0
MAPS	8.5	8.5	16.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
NLC - I	50.7	50.7	50.7	40.4	33.8	36.6	27.2	29.1	39.5	50.7	50.7	50.7
NLC - II	66.7	66.7	66.7	66.7	62.0	54.5	47.0	53.6	43.2	65.8	66.7	66.7
Kaiga	42.3	42.3	21.6	21.6	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3
ER	76.1	76.1	76.1	76.1	76.1	76.1	76.1	76.1	76.1	76.1	76.1	76.1
Kayamkulam	160.0	160.0	160.0	100.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0
BKPL	150.0	150.0	105.0	55.0	55.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0
KPCL	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
NLC (NEW)	16.9	34.8	34.8	34.8	34.8	27.2	31.0	31.0	31.0	34.8	34.8	26.3
Talcher - I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Talcher - II	63.0	63.0	63.0	63.0	63.0	63.0	125.9	125.9	125.9	125.9	125.9	125.9
Ramagundam (New)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kuthungal (Hydel)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EDLDC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PTC	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maniyar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1122.9	1107.8	1049.7	821.8	924.1	909.0	1034.2	1042.7	1042.7	1080.3	1081.2	1070.9

3. *Merit Order stack up:* Based on the variable cost of generation of each plant, the plants are arranged in merit order for each month of the ensuing year. For external sources the variable cost is grossed up for out-of-state transmission losses to reflect the actual variable cost incident on KSEB system. Any variable transmission cost applicable to a source is also added to obtain the “variable cost” for merit order despatch purpose.

Hydel stations of KSEB have been assumed to be despatched in the same pattern as in 2001-02. The stations of NPC have been considered as “must run” stations as they can not be

backed down as per merit order due to technical constraints. Also the KPCL plant has been considered as “must run” on account of technical considerations. The following table shows the merit order stack up for the rest of the sources.

Table 43. Merit Order Stack-up

Source	Variable cost (Rs./kWh)	Merit Order Rank
Hydel	0.03	1
Wind -Kanjikode	0.25	2
Talcher - II	0.46	3
Talcher - I	0.47	4
NLC - I	0.75	5
Ramagundam (Old)	0.99	6
NLC (NEW)	1.03	7
NLC - II	1.05	8
Kuthungal (Hydel)	2.00	9
WR	2.01	10
Additional Purchase (PTC)	2.05	11
ER	2.14	12
KDPP	2.58	13
BDPP	2.73	14
EDLDC	3.09	15
BKPL	3.10	16
Ramagundam (New)	3.16	17
Kayamkulam	3.21	18
Maniyar	3.40	19

4. *Generation and Power Purchase Schedule:* This is the final step wherein the generation and power purchase schedule for each month is determined considering the demand (as per the representative load curve for that month), availability and the merit order stack up.

The hour-wise possible generation from all hydro stations has been assumed to follow the same pattern as in the corresponding month in FY 2001-02. FY2002-03 being an exceptionally poor and irregular monsoon year, the pattern of this year has not been used. The underlying assumption is that all possible measures are taken by KSEB to despatch hydel stations efficiently to reduce system cost. The total hydel generation projected for the year is about 5658 MU and with an auxiliary consumption of 28 MU, the net available hydel energy is 5630 MU.

The plants of NPC have been taken as “must run” plant due to technical considerations. The KPCL plant is also taken as “must run” due to grid requirements arising out of its location and the existing transmission bottlenecks.

The detailed demand and despatch schedule for the twelve months of 2003-04 are provided in Forms – 18 A to F.

APPENDIX C: WORKING CAPITAL COMPUTATION

The major balance sheet elements have already been discussed in detail in Section 2. This appendix only includes the working capital assumptions and projections.

C.1 Working Capital assumptions

The table below summarizes the working requirement assessed for the year 2002-03 and 2003-04. The key assumptions on the working capital elements are discussed here.

Table 44. Working Capital Requirement

Particulars	FY 2002	FY 2003	FY 2004
Current Assets	Rs. Cr	Rs. Cr	Rs. Cr
Stock	508.15	341.93	350.94
Receivables against supply of power	625.85	769.33	740.83
Receivables against Inter-state sale of power	0.92	-	-
Receivables against Elec. Duty	66.58	66.58	66.58
Receivables from permanently disconnected consumers (net of security deposit forfeited)	0.05	0.05	0.05
Sundry debtors	113.32	113.32	113.32
Less: Provision for bad and doubtful debts	40.34	78.66	122.19
Net receivables from sale of power	766.38	870.62	798.58
Cash and Bank balance	324.72	230.51	228.78
Loans and Advances	46.35	46.35	46.35
Sundry receivables	384.95	384.95	384.95
Short term investments	-	0.00	(0.00)
Subsidy receivable from GoK	1,659.73	2,564.21	2,564.21
Total Current Assets (D)	3,690.28	4,438.58	4,373.83
Total Current Assets Unadjusted for Provisions and Excluding ST Investments	3,730.62	4,517.24	4,496.02
Current Liabilities			
Fuel related liabilities	22.06	27.37	43.14
Power Purchase from Others	62.23	306.60	261.09
Liability for Capital Supplies/Works	167.68	87.14	125.00
Liability for O&M Supplies/Works	69.17	12.35	25.63
Staff related liabilities	205.77	205.77	205.77
Deposits and retentions	208.26	273.26	323.26
Elec. Duty and other levies payable	51.50	5.28	5.28
Other current liabilities	122.97	122.97	122.97
Deposits for Electrification, Service connection etc.	180.69	180.69	180.69
Consumer Security Deposit	312.36	362.36	412.36
Total Current Liabilities (F)	1,402.68	1,583.80	1,705.20
Additional liability towards Capex		257.91	257.91
Increase in Net Working Capital for Financing Requirement		605.50	(142.61)

It may be appreciated that though the financial year 2002-03 is over, details of current assets and current liabilities are not yet available due to the manual accounting done in most of the

units and the current data and infrastructure bottlenecks. Certain assumptions are made while preparing the balance sheet as on March 31, 2003. **The actual balance sheet will definitely vary from the current estimated one.** The key elements of working capital assessment are discussed below:

C.1.1 Stocks

The stocks shown in the books of accounts shows both Capital stores and O&M stores. As on March 31, 2002, Rs. 178.57 Cr. was shown as O&M stocks, the rest has been taken as capital stocks. For the projection, as the total base investments (primarily materials) are shown in CWIP, the level of capital stocks is assumed at the same level. The change in the balance of stocks is assumed only due to change in O&M Stocks. The O&M Stocks are estimated at 3 months' of Repairs and Maintenance Expenses for 2002-03 and 2.5 months of these expenses for 2003-04.

C.1.2 Cash and Bank Balance

A normative level of cash and bank balance is estimated as part of the working capital requirement of the Board. It is estimated as 1 month's expense on some specified expenses where some cash payment is expected periodically. The key expenses considered are generation expenses, power purchase expenses, employee costs, and other administration and general expenses. The totals of these expenses are Rs. 2766.14 Cr. in 2002-03 and 2745.42 Cr. in 2003-04.

C.1.3 Receivables from Sale of Power

The expected increase in efficiency of the Board has been considered while estimating the level of these receivables. For this purpose the receivables have been classified in two parts, one those as on books as on March 31, 2002 (Rs. 625.85 Cr.) and those that are likely to arise out of Board's operations subsequently. Out of the Rs. 625.85 Cr., it is estimated that Rs. 250 Cr. (being recent receivables) may be collected during 2002-03 and Rs. 75 Cr. during 2003-04.

The receivables arising out of operations after March 31, 2002 are estimated at 60 days of sales during the year, considering the monthly and bi-monthly billing cycle, the collection efficiency and expected blockage due to disputes etc.

Based on the above, the receivables at the end of 2002-03 is estimated at Rs. 769.33 Cr. and that at the end of 2003-04 at Rs. 740.83 Cr. It is to be noted that these levels are on significantly higher revenues expected in these years.

For 2002-03 and 2003-04, Receivables from Electricity Duty and Sundry Debtors are estimated at the same level as in 2001-02.

C.1.4 Loans and advances and sundry receivables

Estimated at the same level as on March 31, 2002.

C.1.5 Subsidy Receivables

This is one of the key difficult areas the Board is facing at present. The following table shows the past subsidy receivables and the adjustments agreed by the GoK towards part clearance of the outstanding subsidy payments. It may be noted that even after netting off a substantial amount of dues payable to GoK by KSEB on account of Electricity Duty, etc., a significant amount of subsidy is still outstanding. It may also be noted that the amount of Rural Electrification (RE) subsidy is also due from the government.

Table 45. Subsidy outstanding from GoK

Particulars	Amount (Rs. Cr)
Revenue Subsidy Due as on 31-03-2002 (A)	3,874.46
Revenue Subsidy Netted off vide GO(MS) No. 25/02/PD dated 09/10/02 (B)	2,214.73
Balance Revenue Subsidy as on 31-03-2002 (C=A-B)	1,659.73
Estimated Revenue Subsidy for 2002-03 (F)	1,104.48
Total Subsidy (G=E+F)	2764.21
Revenue Subsidy netted off vide G.O.(Rt)No.3706/03/Fin dtd 31-03-2003 (H)	200.00
Balance Subsidy as on 31-03-2003 (I=G-H)	2564.21

The balance is projected as the same at the end of the year 2003-04 as the Board expects cash payment of agreed subsidy during the year 2003-04.

C.1.1 Consumer Security Deposit

Based on past additions to this account, Rs. 50 Cr. is estimated to be available during the year 2002-03 and Rs. 50 Cr. during 2003-04.

C.1.2 Fuel related liabilities

Estimated at 60 days of generation cost of Rs. 166.52 Cr. in 2002-03 and Rs. 263.17 Cr. in 2003-04.

C.1.3 Power Purchase liabilities from others

Estimated at 60 days of power purchase cost of Rs. 1865.17 Cr. in 2002-03 and Rs. 1592.63 Cr. in 2003-04.

C.1.4 Liabilities for Capital Supplies/Works

Estimated at 3 months' of base capital expenditure of Rs. 348.56 Cr. in 2002-03 and Rs. 500 Cr. in 2003-04.

C.1.5 Liabilities for O&M Supplies/Works

Estimated at 3 months' of Repairs and Maintenance Expenses during the year.

C.1.6 Deposits and Retention

Rs. 65 Crores of additional deposits and retentions have been estimated for the year 2002-03 and Rs. 50 crores for the year 2003-04..

C.1.7 Other staff related liabilities

Estimated to remain at the same level as on March 31, 2002.

C.1.8 Electricity duty payable

The electricity duty payable u/s 4, which is collected from the consumers for consumption of electricity is taken as payable to GoK. No accretion to this has been assumed.

C.1.9 Additional liability towards capex

During 2002-03, it has been adopted as the balancing item to bridge the funding gap arising out of internal resources, loan repayments, borrowings and capital expenditure requirements. The additional amount is Rs. 163.42 Cr., which is expected to remain at the same level in 2003-04. Existing Tariff Schedule (Gazette Notifications Dated 1st November 2002 and 9th April 2003) is given as Appendix D.

APPENDIX D: EXISTING TARIFF SCHEDULE

DATA FORMS