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REPORT ON THE PERFORMANCE

OF THE ELECTRICITY SUPPLY SERVICES IN PENINSULAR MALAYSIA AND SABAH

Interim Report for the First Half Year of 2003

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REPORT ON THE PERFORMANCE

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Published by:

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Electricity Supply Department
Energy Commission

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1.0 INTRODUCTION

This interim report provides an overview on the performance of electricity supply services in Peninsular Malaysia and Sabah for the first 6 months in 2003.

The various aspects covered in this report include supply and demand, electricity sales, reliability of supply, numbers and causes of supply interruptions and power quality.

This report focuses mainly on the electricity supply by the main utilities i.e. Tenaga Nasional Berhad (TNB) in Peninsular Malaysia, Sabah Electricity Sdn. Bhd. (SESB) in Sabah and the mini utility NUR Distribution Sdn. Bhd. at Kulim Hi–Tech Industrial Park in Kedah. Nevertheless it is not intended for direct comparison on the performance of the utilities as several factors need to be considered such as area of supply, number of customers served, electricity supply system, level of economic development and data collection.

The installed generation capacity and maximum demand in Peninsular Malaysia up to June 2003 were 15,643 MW and 11,329 MW respectively. Meanwhile in Sabah, the total installed capacity was 782 MW, with a total maximum demand at 432 MW.

For the first 6 months in 2003, the sales of electricity by TNB increased to 32,127 GWh compared with 29,943 GWh for the same period last year. For SESB the sales increased from 1,055 GWh in the first 6 month of 2002 to 1,145 GWh for the same period in 2003.

The total numbers of consumers of TNB, SESB and NUR Distribution are 5.5 million, 313,318, and 867 respectively.

2.1 Maximum Demand and Generation Capacity

Figure 1 : Monthly Maximum Demand of the Grid System in Peninsular Malaysia and Generation Capacity

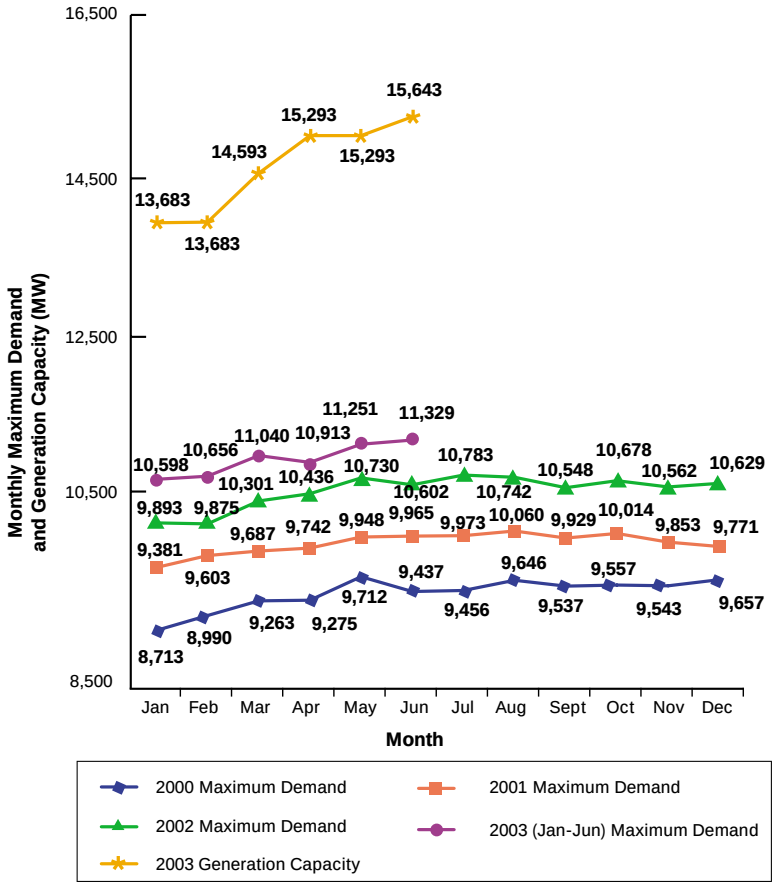
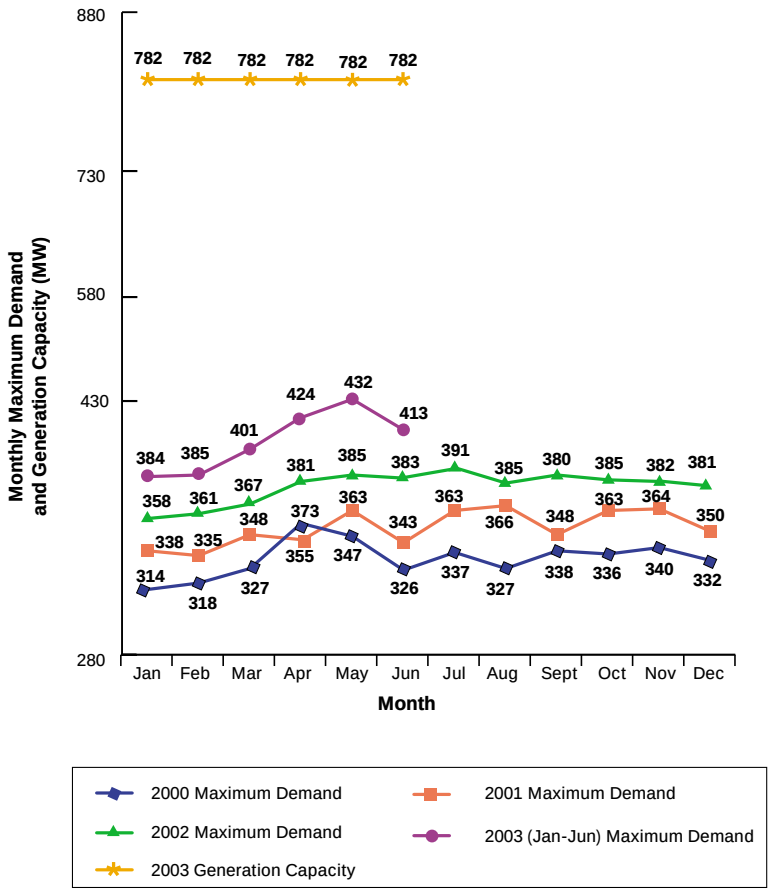
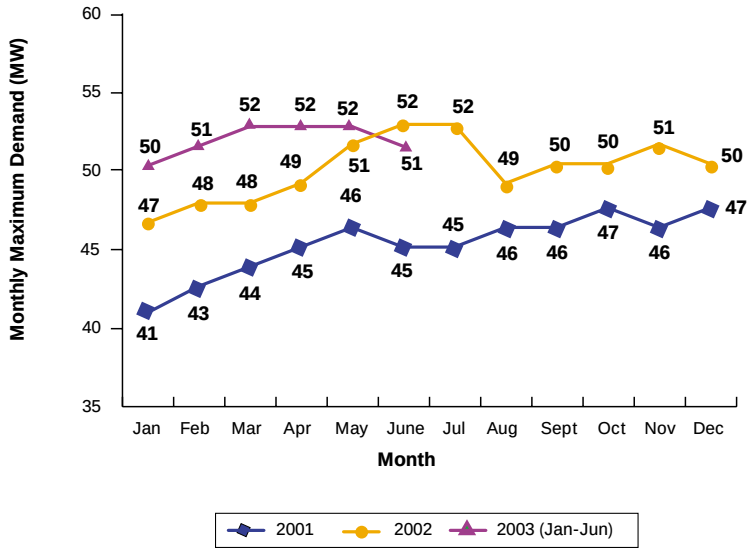


Figure 2 : Monthly Maximum Demand for West Coast Grid of Sabah, Tawau and Sandakan and Generation Capacity



N.B. : The three systems in Sabah are not interconnected. The maximum demand as shown are the arithmetic sum of the demands of the three systems.

Figure 3 : Monthly Maximum Demand of Nur Distribution Sdn. Bhd.



3.1 Monthly Sales of Energy of TNB, SESB and NUR

Figure 4 : Monthly Sales of Energy of TNB (GWh) for the First Half Year of 2003

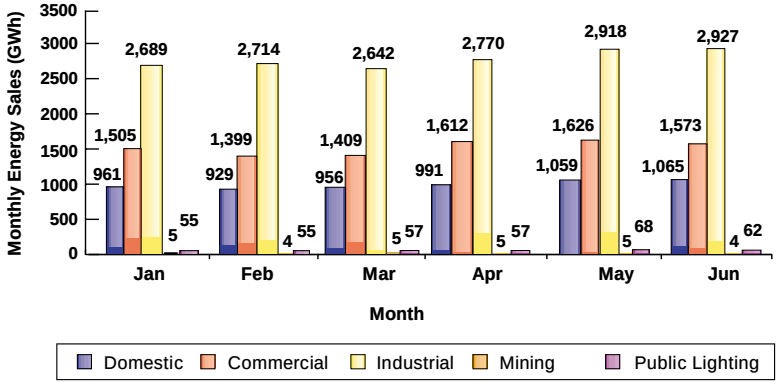


Figure 5 : Monthly Sales of Energy of SESB (GWh) for the First Half Year of 2003

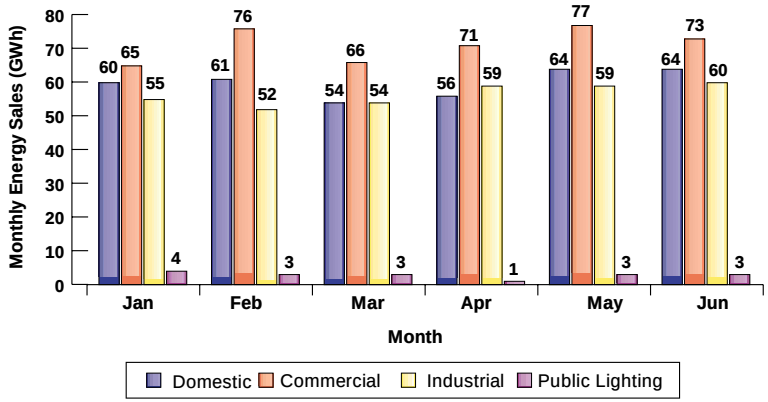
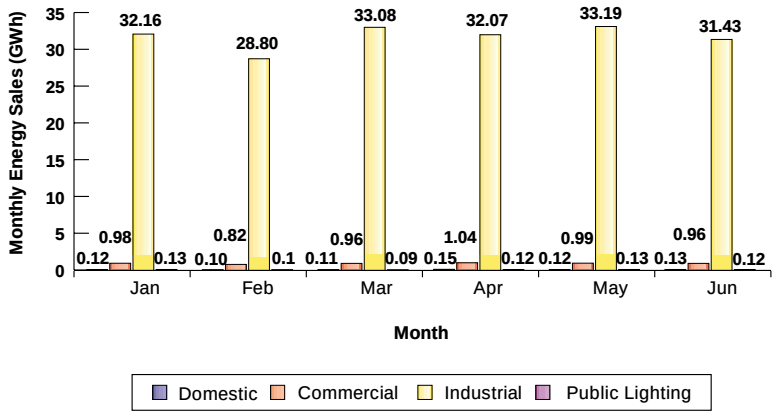
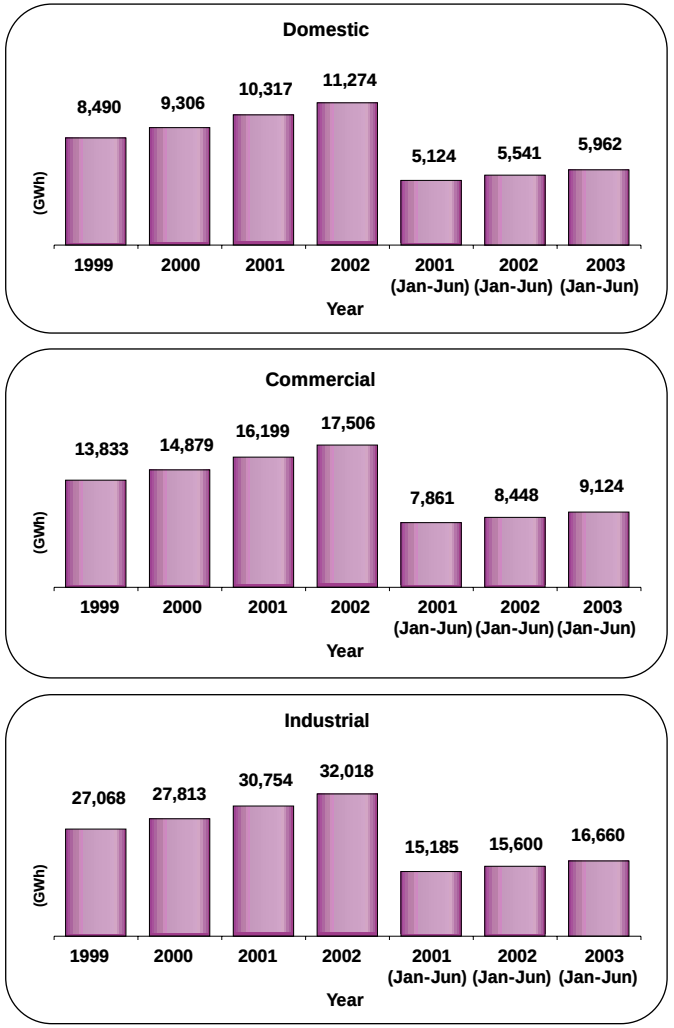


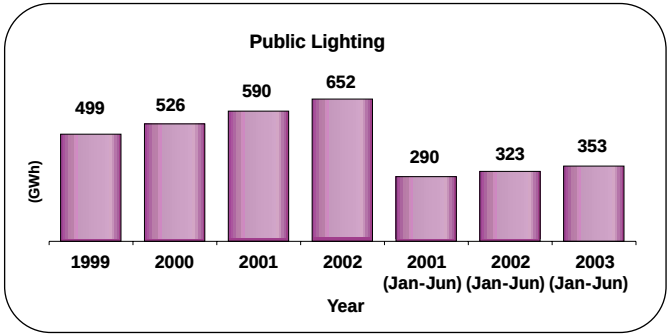
Figure 6 : Monthly Sales of Energy of Nur Distribution Sdn. Bhd. (GWh) for the First Half Year of 2003

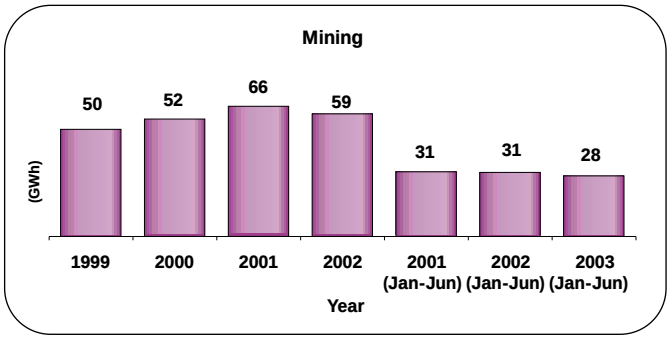


3.2 Yearly Sales of Energy of TNB, SESB and NUR

Figure 7 : Comparison of the Total Energy Sales (GWh) by TNB for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year (1999 – 2002)







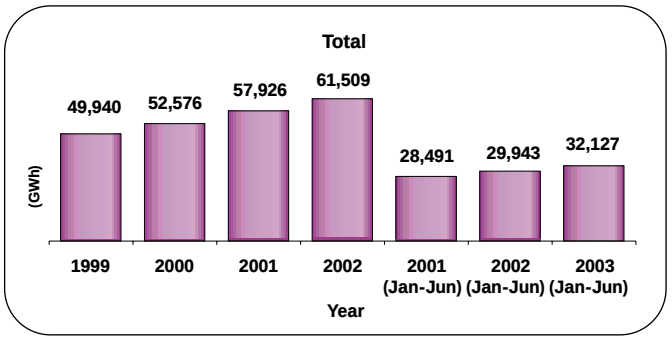
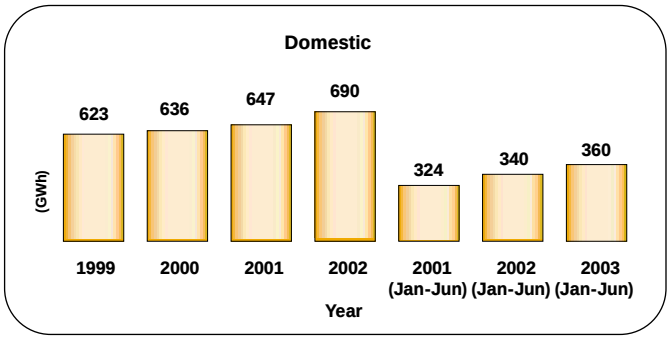
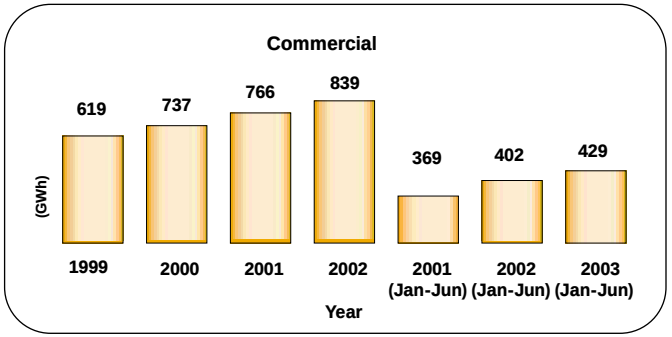
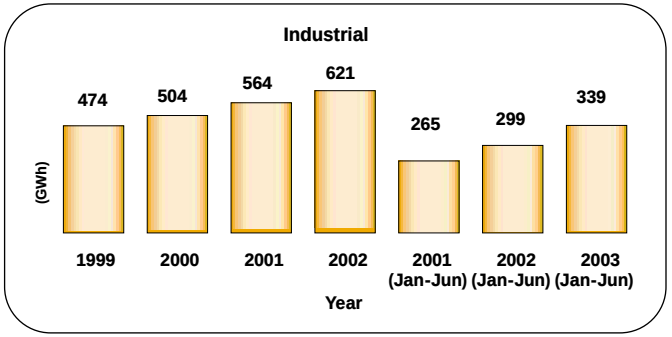
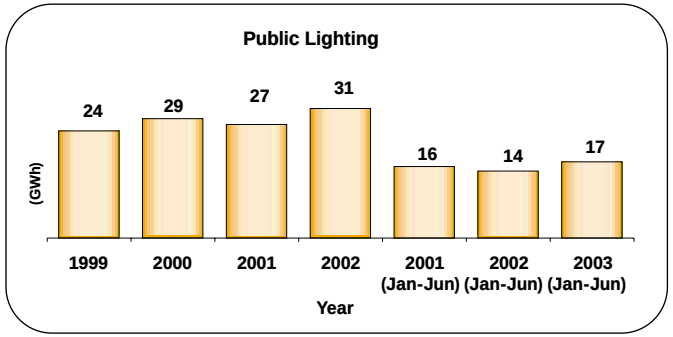


Figure 8 : Comparison of the Total Energy Sales (GWh) of SESB for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year (1999 – 2002)









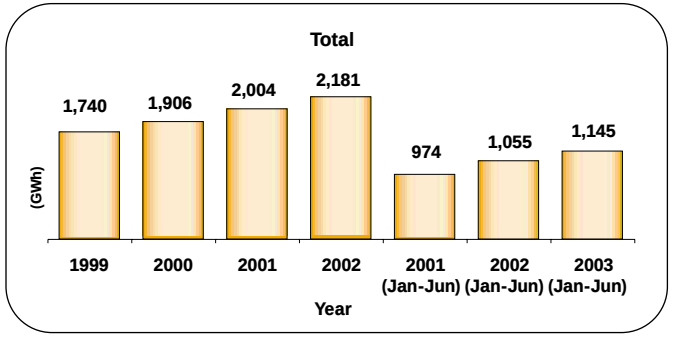
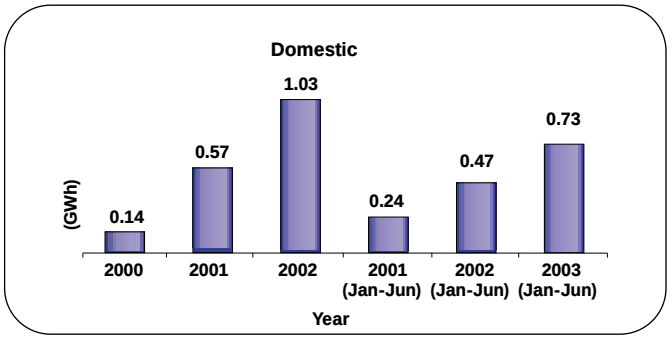
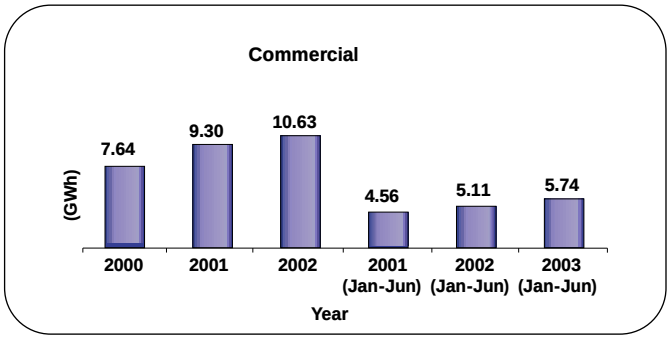


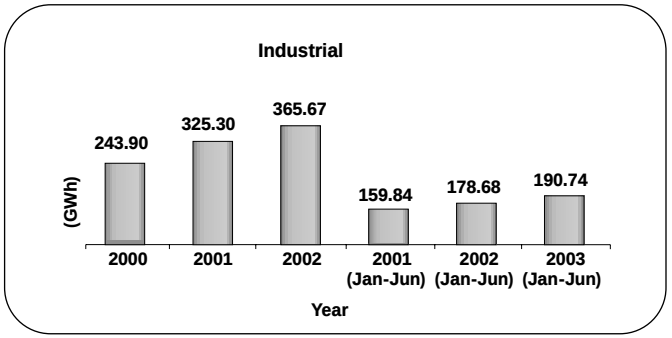
Figure 9 : Comparison of the Total Energy Sales (GWh) of NUR Distribution Sdn. Bhd. for :-

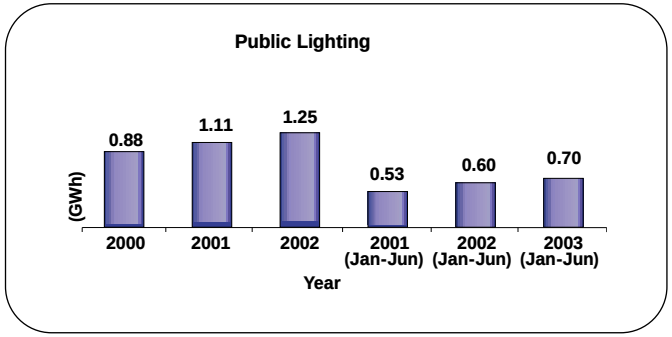
i) First Half Year of 2001, 2002 and 2003

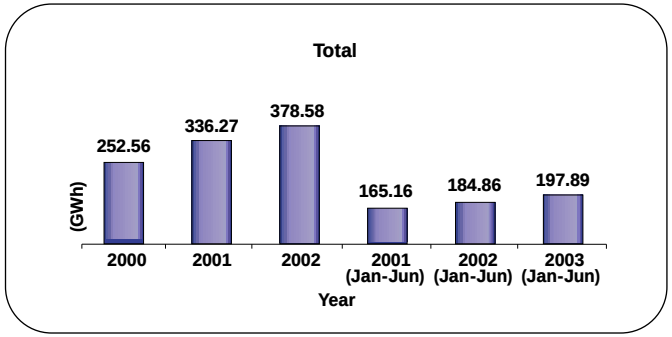
ii) In the Year 2000, 2001 and 2002





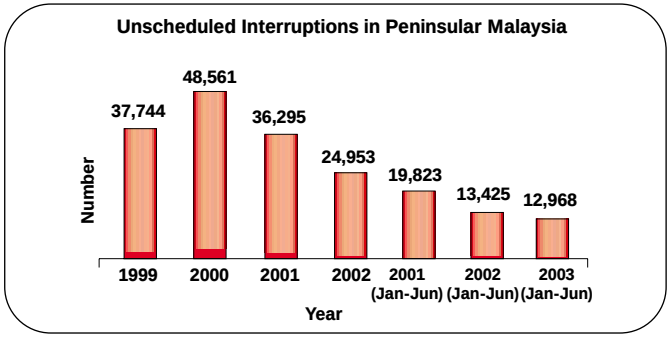


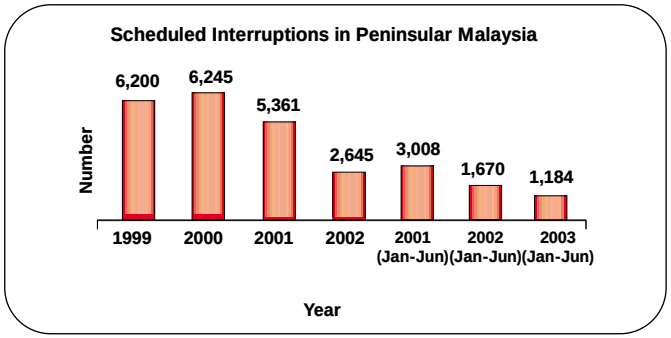




4.1 Statistics of Interruptions of Supply - TNB

Figure 10 : Electricity Supply Interruptions in Peninsular Malaysia for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year (1999 – 2002)





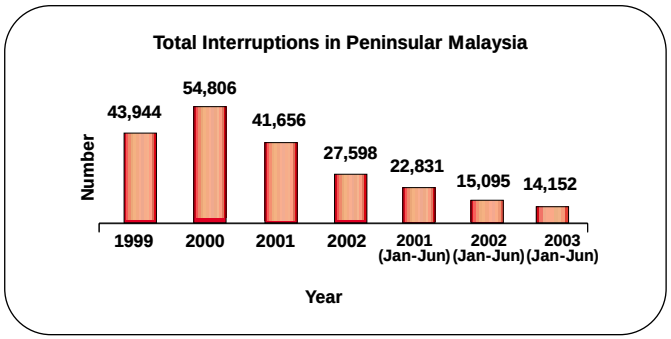


Figure 11 : Monthly Average of Electricity Supply Interruptions in Peninsular Malaysia for :-

i) First Half Year of 2001, 2002 and 2003

ii) In the Year (1999-2002)

Average Number of Monthly Electricity Supply Interruptions in Peninsular Malaysia for the First Half Year of 2003

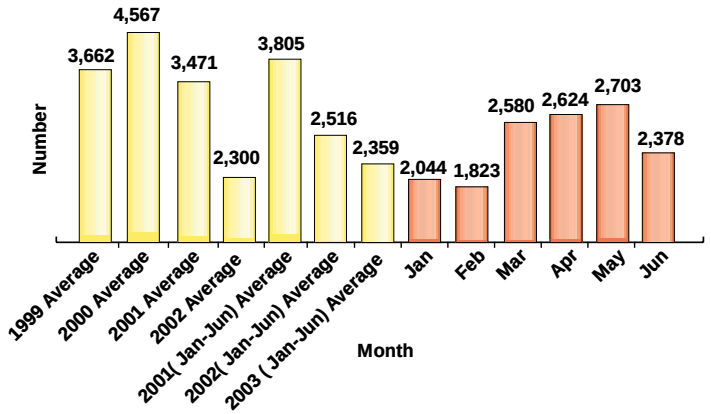
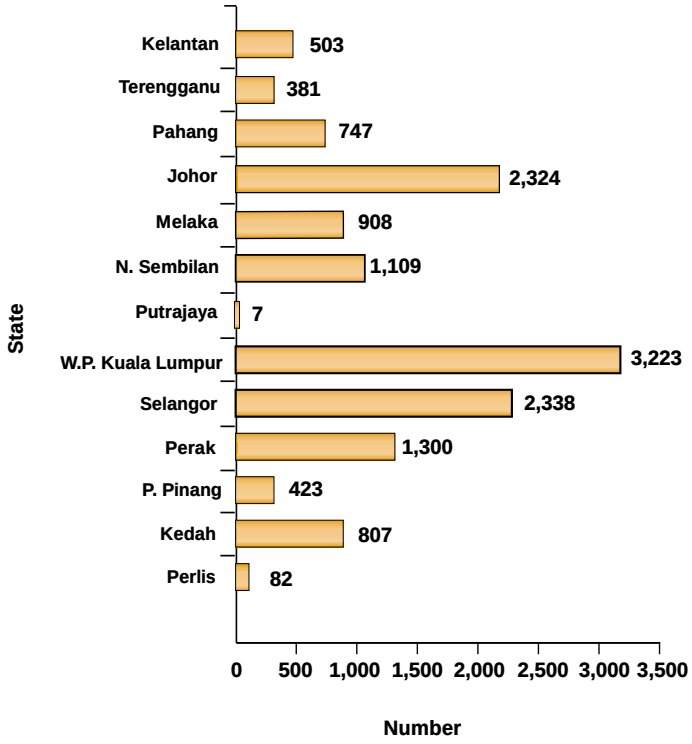
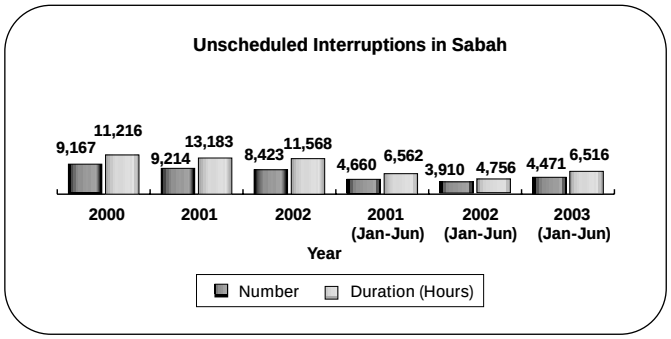


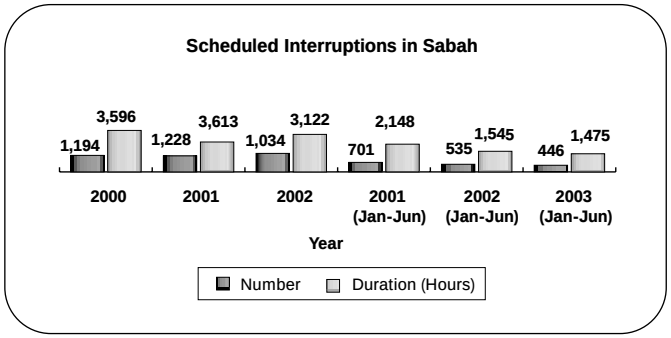
Figure 12 : Total Cumulative Number of Electricity Supply Interruptions for the States in Peninsular Malaysia for the First Half Year of 2003 (Jan-Jun)



4.2 Statistic of Interruptions of Supply - SESB

Figure 13 : Electricity Supply Interruptions in Sabah for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year 2000, 2001 and 2002





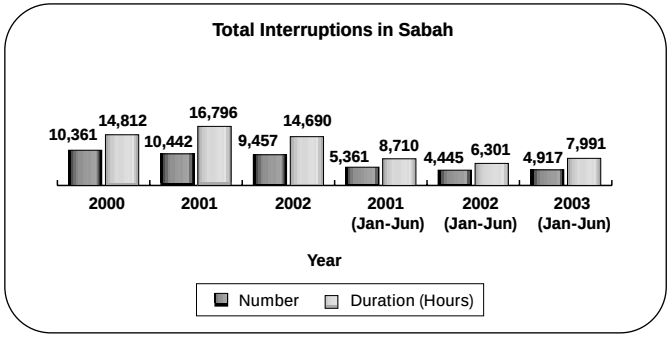
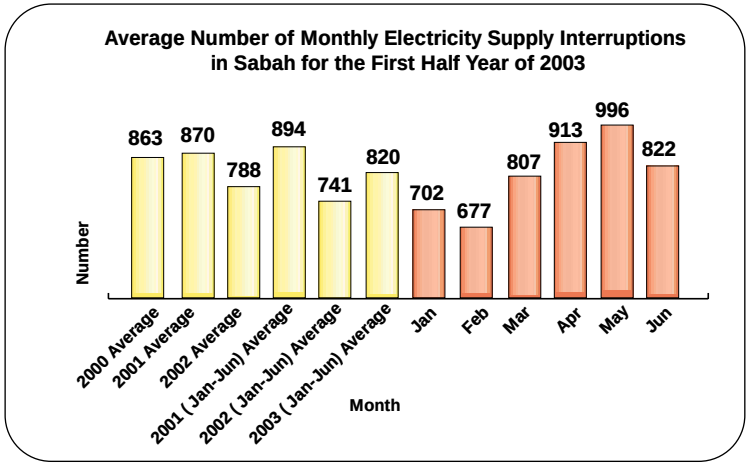
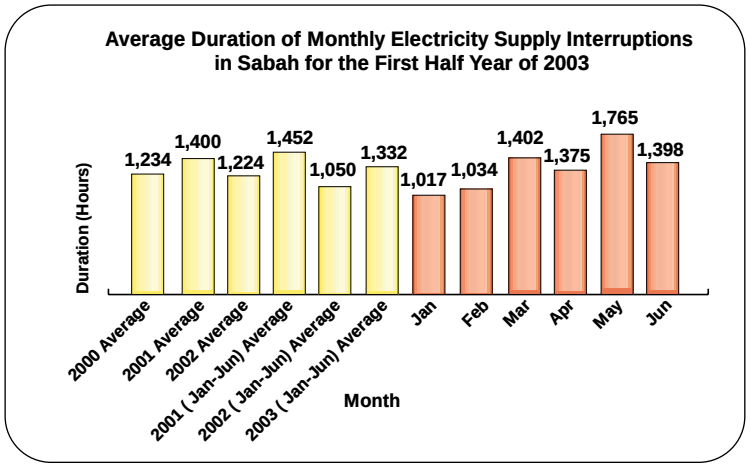


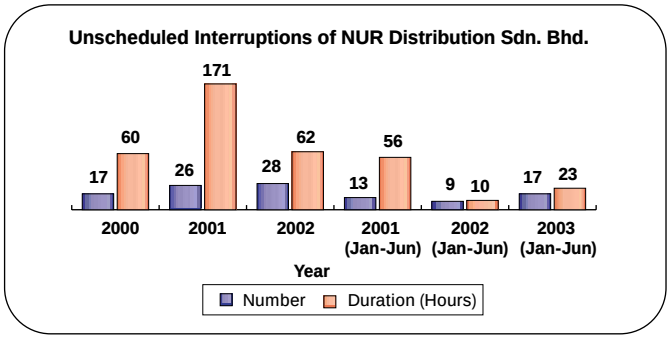
Figure 14 : Monthly Average of Electricity Supply Interruptions in Sabah for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year 2000, 2001 and 2002

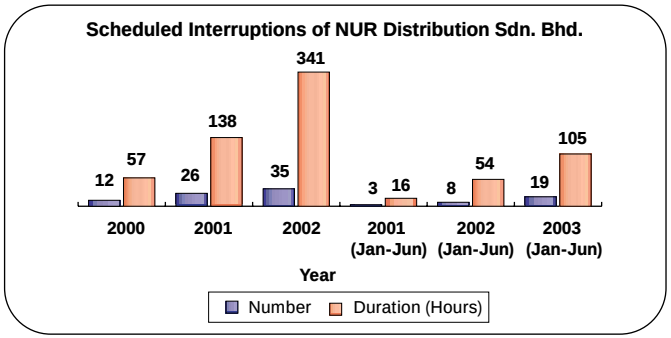




4.3 Statistics of Interruptions of Supply - NUR

Figure 15 : Electricity Supply Interruptions in Kulim Hi-Tech Park Reported by NUR Distribution Sdn. Bhd. for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year 2000, 2001 and 2002





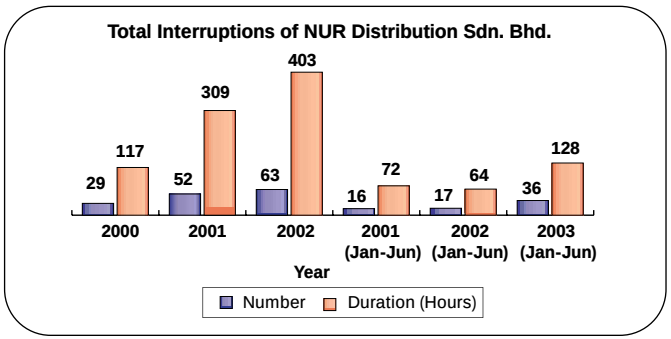
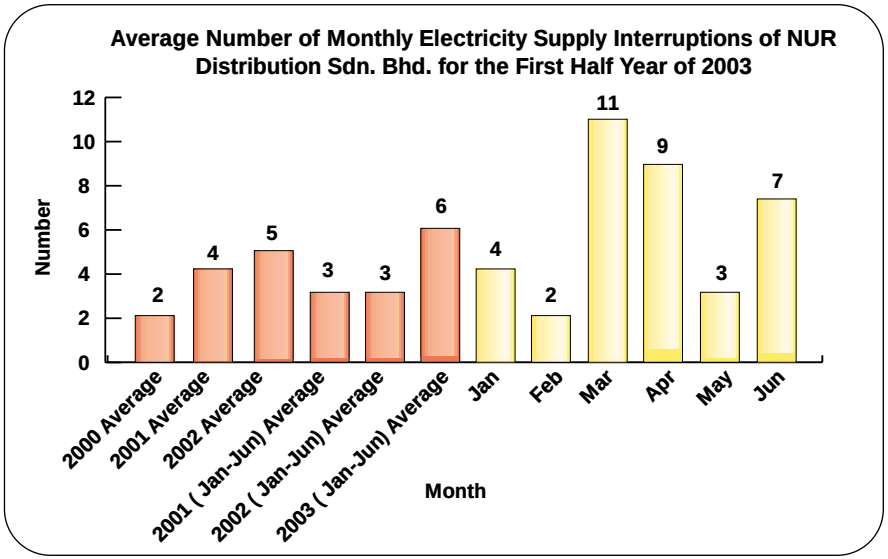
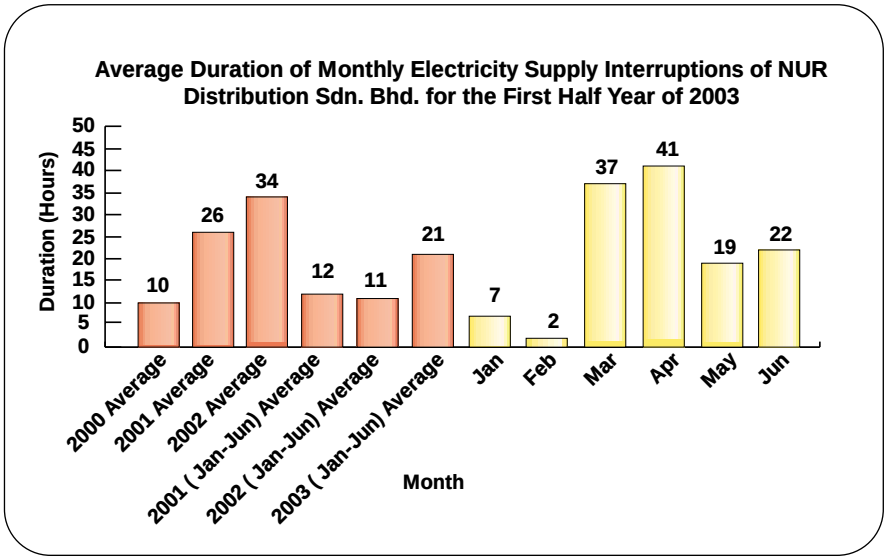


Figure 16 : Monthly Average of Electricity Supply Interruptions in Kulim Hi-Tech Park Reported by NUR Distribution Sdn. Bhd. for :-
i) First Half Year of 2001, 2002 and 2003
ii) In the Year 2000, 2001 and 2002





4.4 Distribution System of TNB

4.4.1 System Average Interruption Duration Indeks (SAIDI)

Table 1 : SAIDI for the States in Peninsular Malaysia for the First Half Year of 2003 compared with the same Period of the Previous Years

Year	Overall SAIDI	State with Highest SAIDI	State with Lowest SAIDI
1999 (Jan-Jun)	202	Johor (427)	Perlis (21)
2000 (Jan-Jun)	177	Pahang (311)	Perlis (29)
2001 (Jan-Jun)	153	Johor (223)	Perlis (26)
2002 (Jan-Jun)	60.9	Pahang (105) & Johor (105)	Perlis (16.2)
2003 (Jan-Jun)	56.2	Pahang (145.5)	Putrajaya (6.3)

Figure 17 : Monthly SAIDI in Peninsular Malaysia for the First Half Year of 2003

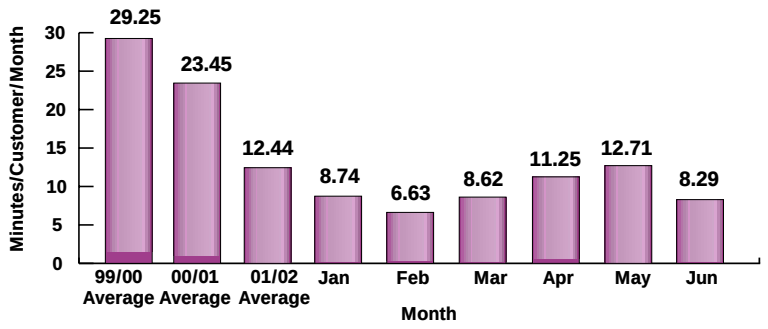
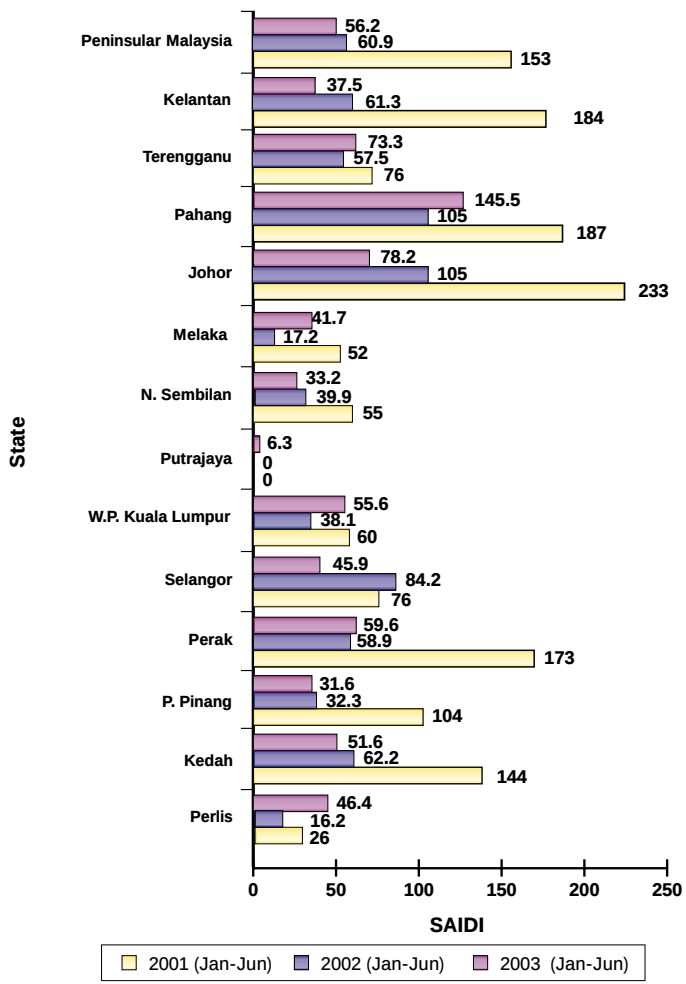
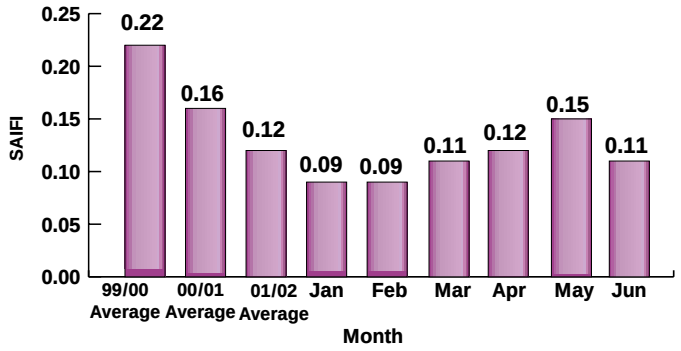


Figure 18 : SAIDI (Minutes/Customer) for the States in Peninsular Malaysia for the First Half Year of 2001, 2002 and 2003



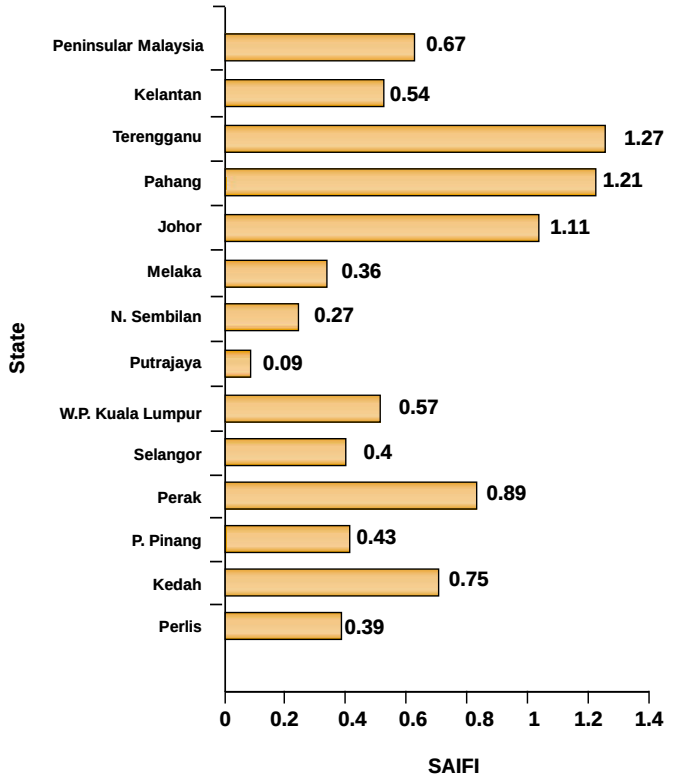
4.4.2 System Average Interruption Frequency Index (SAIFI)

Figure 19 : Monthly SAIFI in Peninsular Malaysia for the First Half Year of 2003



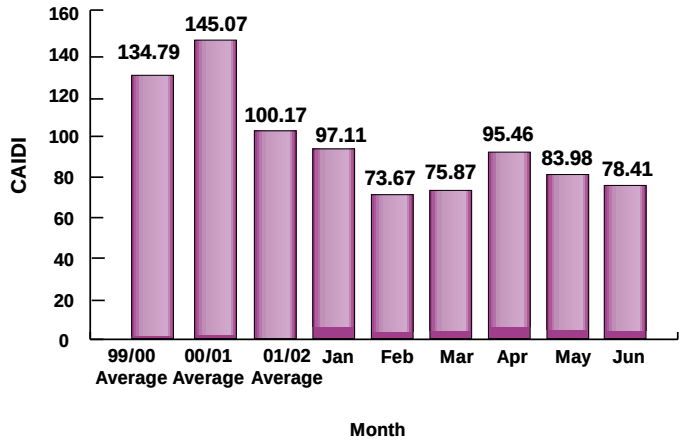
4.0 RELIABILITY OF ELECTRICITY SUPPLY

Figure 20 : SAIFI for the States in Peninsular Malaysia for the First Half Year of 2003 (Jan-Jun)



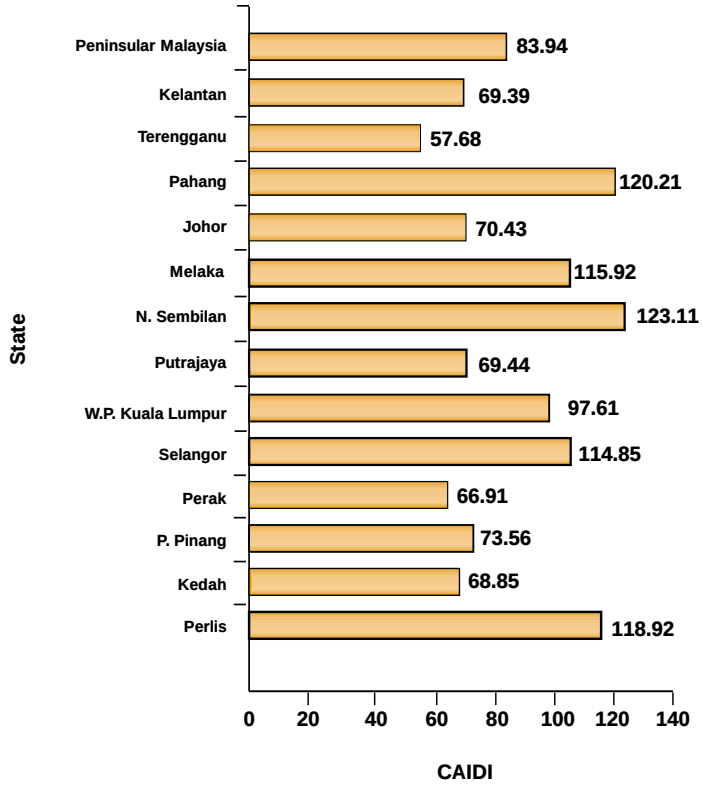
4.4.3 Customers Average Interruption Duration Index (CAIDI)

Figure 21 : Monthly CAIDI in Peninsular Malaysia for the First Half Year of 2003



4.0 RELIABILITY OF ELECTRICITY SUPPLY

Figure 22 : CAIDI for the States in Peninsular Malaysia for the First Half Year of 2003 (Jan-Jun)



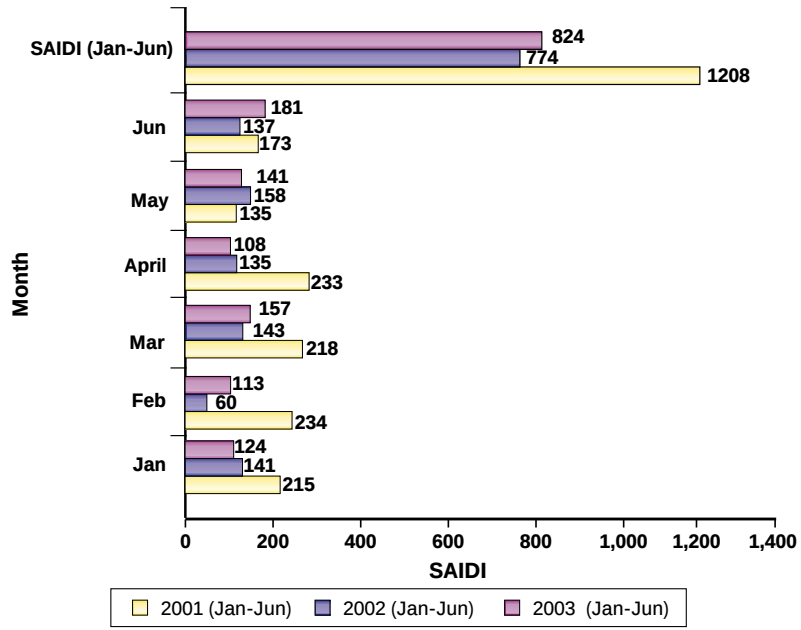
4.5 Distribution System of SESB

4.5.1 System Average Interruption Duration Indeks (SAIDI)

Table 2 : SAIDI in Sabah for the First Half Year of 2003 compared with the same Period of the Previous Years

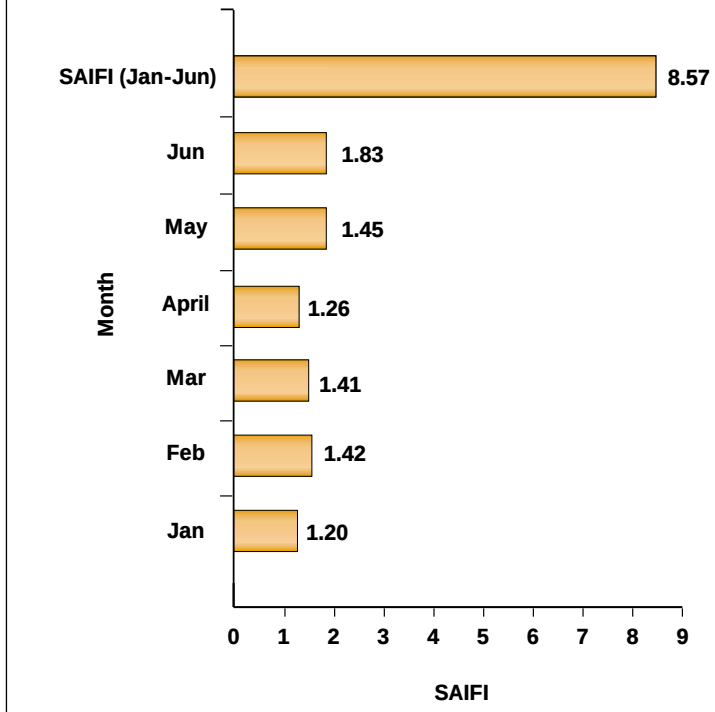
Year	SAIDI
2000 (Jan-Jun)	829
2001 (Jan-Jun)	1,208
2002 (Jan-Jun)	774
2003 (Jan-Jun)	824

Figure 23 : SAIDI (Minutes/Customer) for the State of Sabah for the First Half Year of 2001, 2002 and 2003



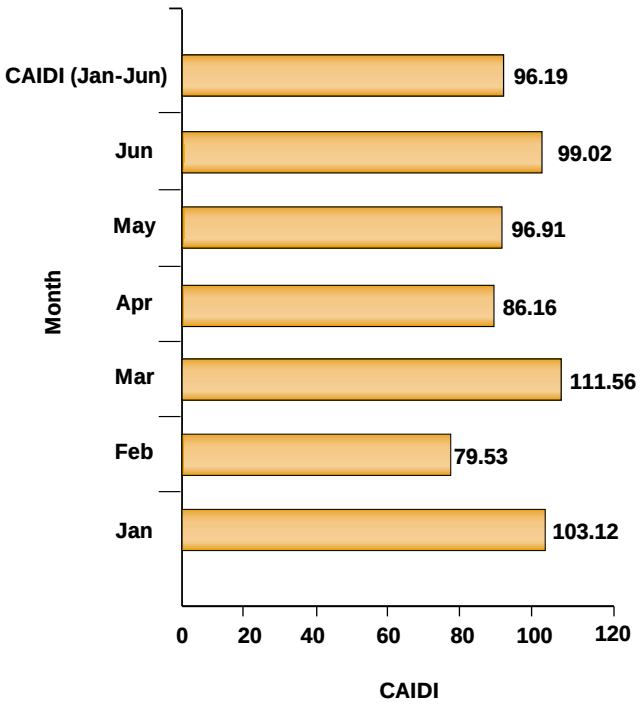
4.5.2 System Average Interruption Frequency Index (SAIFI)

Figure 24 : SAIFI in Sabah for the First Half Year of 2003 (Jan-June)



4.5.3 Customer Average Interruption Duration Index (CAIDI)

Figure 25 : CAIDI in Sabah for the First Half Year of 2003 (Jan-Jun)



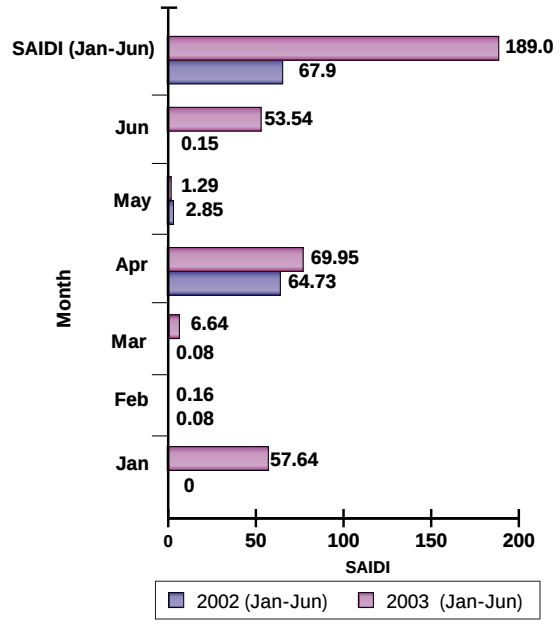
4.6 Distribution System of NUR

4.6.1 System Average Interruption Duration Indeks (SAIDI)

Table 3 : SAIDI in Kulim Hi-Tech Park Reported by NUR Distribution Sdn. Bhd. for the First Half Year of 2003 compared with the same Period of the Previous Years

Year	SAIDI
2000 (Jan-Jun)	168.3
2001 (Jan-Jun)	613.1
2002 (Jan-Jun)	67.9
2003 (Jan-Jun)	189.0 (Overall) 56.9 (Planned Interupptions) 132.1 (Unplanned Interupptions)

Figure 26 : SAIDI (Minutes/Customer) NUR Distribution Sdn. Bhd. for the First Half Year of 2002 and 2003

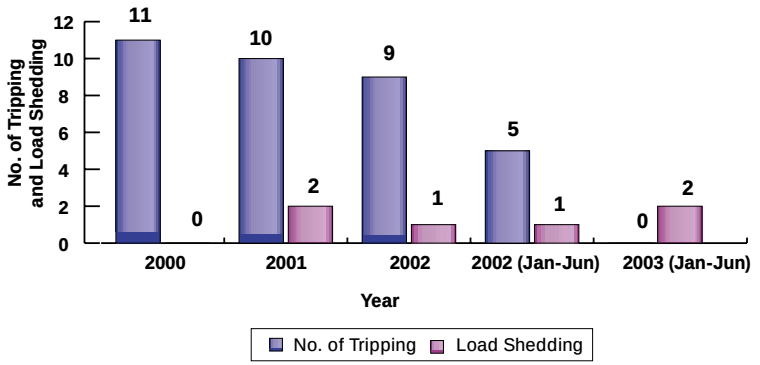


4.7 Performance of the Transmission System in Peninsular Malaysia

Table 4 : Statistics of Transmission System Tripping with a Load Loss of 50 MW and Above for the First Half Year of 2003 (Jan-Jun)

Indicators	Jan	Feb	Mar	Apr	May	Jun	Total from Month (Jan-Jun)
No. of Trippings	0	0	0	0			**0**
Maximum Load Losses (MW)					468	285	**753**
Unsupplied Energy Due to Trippings (MWh)							**0**
Average Unsupplied Energy per Trip (MWh)							**0**
Average Duration per Trip (Hour)					02:09	01:03	**03:12**
No. of Load Sheddings					1	1	**2**
Unsupplied Energy During Load Sheddings (MWh)					374	197.07	**571.07**

Figure 27 : Number of Transmission System Tripping with a Load Loss of 50 MW and Above for the Year 2000, 2001, 2002 and for the First Half Year of 2002 and 2003

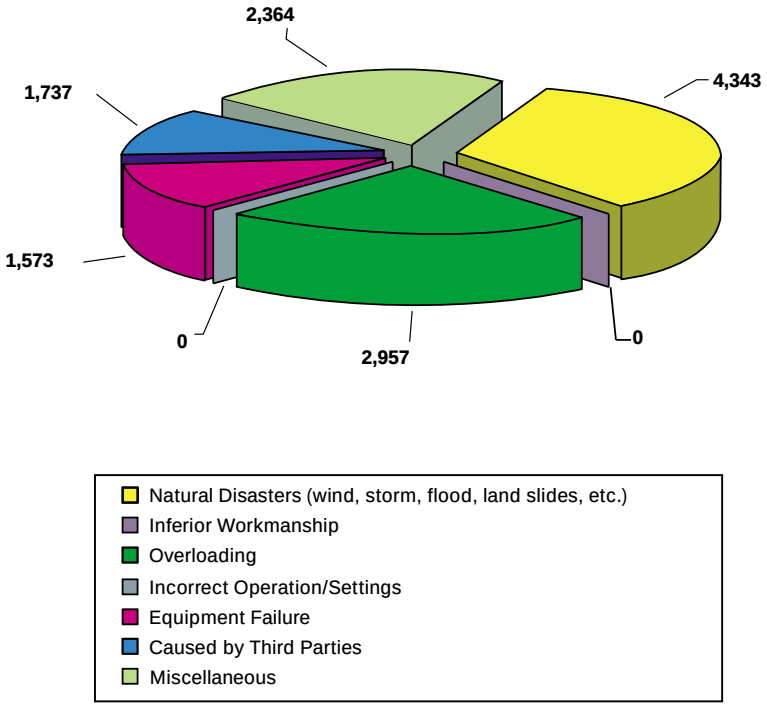


5.1 Causes of Electricity Supply Interruptions - TNB

Table 5 : Causes of Unscheduled Electricity Supply Interruptions in Peninsular Malaysia for :-
i) First Half Year of 2002 and 2003
ii) In the Year (1999 – 2002)

Unscheduled Causes of Interruptions	Number of Interruptions					
	1999	2000	2001	2002	2002 (Jan-Jun)	2003 (Jan-Jun)
Natural Disasters (wind, storm, flood, land slides, etc.)	14,687 (38.9%)	18,268 (37.6%)	13,914 (38.5%)	7,953 (31.9%)	4,125 (30.7%)	**4,343 (33.5%)**
Inferior Workmanship	5,429 (14.4%)	6,198 (12.8%)	5,038 (13.9%)	3,192 (12.8%)	1,644 (12.2%)	-
Overloading	4,372 (11.6%)	5,106 (10.5%)	4,243 (11.7%)	4,953 (19.8%)	2,975 (22.1%)	**2,957 (22.8%)**
Incorrect Operation/Settings	128 (0.3%)	91 (0.2%)	72 (0.2%)	26 (0.1%)	26 (0.2%)	-
Equipment Failure	5,265 (13.9%)	8,582 (17.7%)	5,798 (16.0%)	2,312 (9.3%)	1,632 (12.1%)	**1,573 (12.1%)**
Caused by Third Parties	2,670 (7.1%)	4,050 (8.3%)	3,045 (8.4%)	2,754 (11.0%)	1,351 (10.1%)	**1,737 (13.4%)**
Miscellaneous	5,210 (13.8%)	6,271 (12.9%)	4,021 (11.1%)	3,770 (15.1%)	1,680 (12.5%)	**2,364 (18.2%)**
Total	**37,761**	**48,566**	**36,131**	**24,960**	**13,433**	**12,974**

Figure 28 : Causes of Unscheduled Electricity Supply Interruptions in Peninsular Malaysia for the First Half Year of 2003 (Jan-Jun)

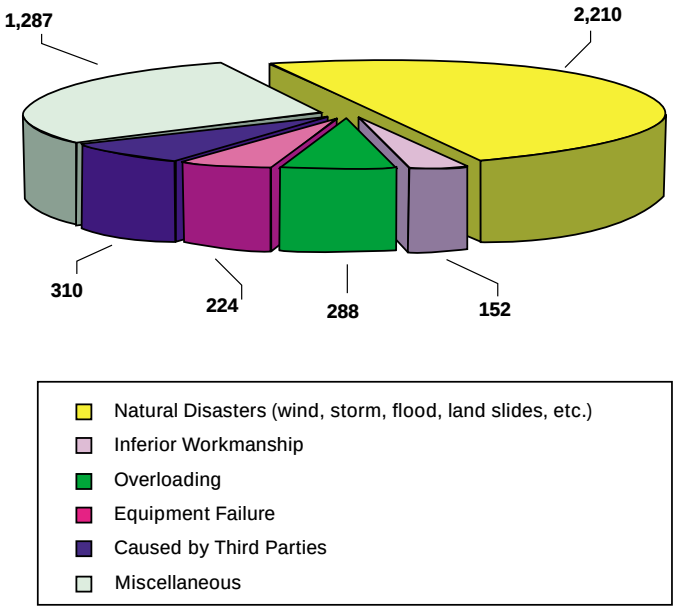


5.2 Causes of Electricity Supply Interruptions - SESB

Table 6 : Causes of Unscheduled Electricity Supply Interruptions in SESB's system for :-
i) First Half Year of 2002 and 2003
ii) In the Year 2000, 2001 and 2002

Unscheduled Causes of Interruptions	Number of Interruptions				
	2000	2001	2002	2002 (Jan-Jun)	2003 (Jan-Jun)
Natural Disasters (wind, storm, flood, land slides, etc.)	6,242 (68.1%)	5,935 (64.4%)	4,668 (55.4%)	2,333 (59.7%)	**2,210 (49.4%)**
Inferior Workmanship	986 (10.8%)	718 (7.8%)	231 (2.7%)	111 (2.8%)	**152 (3.4%)**
Overloading	196 (2.1%)	339 (3.7%)	337 (4.0%)	148 (3.8%)	**288 (6.4%)**
Equipment Failure	439 (4.8%)	564 (6.1%)	413 (4.9%)	214 (5.5%)	**224 (5.0%)**
Caused by Third Parties	348 (3.8%)	432 (4.7%)	442 (5.2%)	210 (5.4%)	**310 (7.0%)**
Miscellaneous	956 (10.4%)	1,226 (13.3%)	2,332 (27.7%)	894 (22.9%)	**1,287 (28.8%)**
Total	**9,167**	**9,214**	**8,423**	**3,910**	**4,471**

Figure 29 : Causes of Unscheduled Electricity Supply Interruptions in Sabah for the First Half Year of 2003 (Jan-Jun)



5.3 Causes of Electricity Supply - Other Electricity Distributors

Table 7 : Unscheduled Electricity Supply Interruptions Reported by Electricity Distribution Licensees Apart from TNB and SESB for the First Half Year of 2001, 2002 and 2003

Unscheduled Causes of Interruptions	Malaysia Airports (Sepang) Sdn. Bhd.			Petronas Gas Berhad (CUF Kerteh)			Petronas Gas Berhad (CUF Gebeng)			K.K.I.P Power Sdn. Bhd.			NUR Distribution Sdn. Bhd.		
	2001 (Jan-Jun)	2002 (Jan-Jun)	2003 (Jan-Jun)	2001 (Jan-Jun)	2002 (Jan-Jun)	2003 (Jan-Jun)	2001 (Jan-Jun)	2002 (Jan-Jun)	2003 (Jan-Jun)	2001 (Jan-Jun)	2002 (Jan-Jun)	2003 (Jan-Jun)	2001 (Jan-Jun)	2002 (Jan-Jun)	2003 (Jan-Jun)
Natural Disasters (wind, storm, flood, land slides, etc.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Equipment Failure	2	0	0	0	0	0	0	0	0	0	0	0	8	1	5
Overloading	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3
Incorrect Operation/Settings	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
Inferior Workmanship	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3
Caused by Third Parties	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Miscellaneous	0	0	0	0	0	0	0	0	0	3	2	0	1	1	0
Total Number	3	0	0	1	0	0	0	0	0	3	2	0	13	9	16
Total Duration (Hours)	99	0	0	1.4	0	0	0	0	0	2.4	1.5	0	56	9.6	23.1

6.1 Incidents of Voltage Dips – Industrial Areas in Penang Island

Figure 30 : Number of Voltage Dips Reported by TNB for the First half Year of 2001, 2002 and 2003

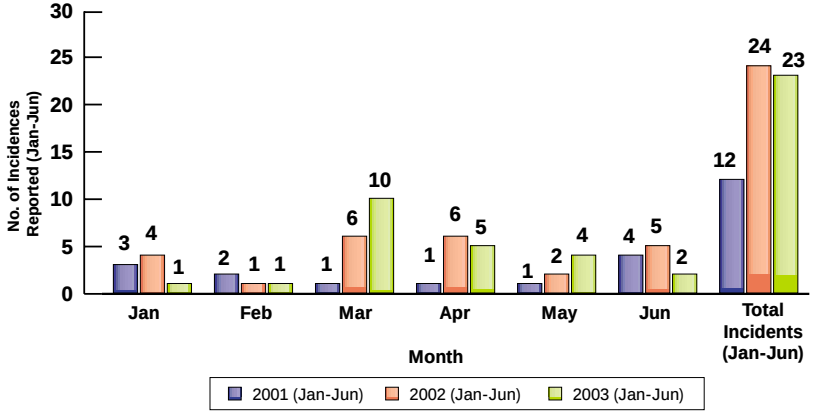
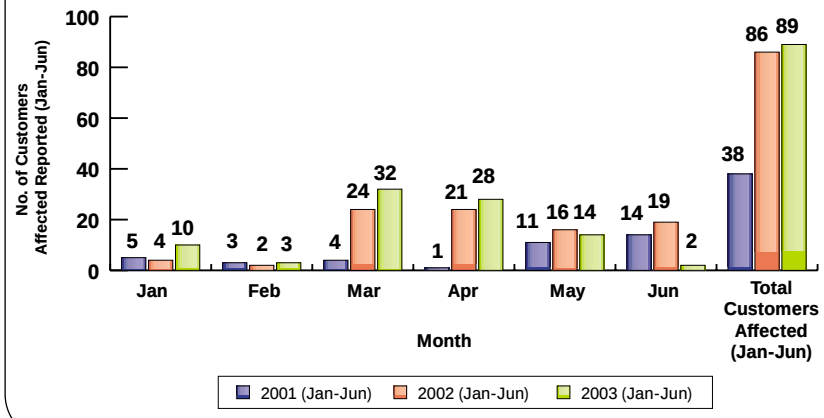


Figure 31 : Number of Customers Affected by Voltage Dips in the First half Year of 2001, 2002 and 2003



6.2 Incidents of Voltage Dips – Kulim Hi-Tech Park

Figure 32 : Number of Voltage Dips Reported by NUR Distribution Sdn. Bhd. for the First Half Year of 2001, 2002 and 2003

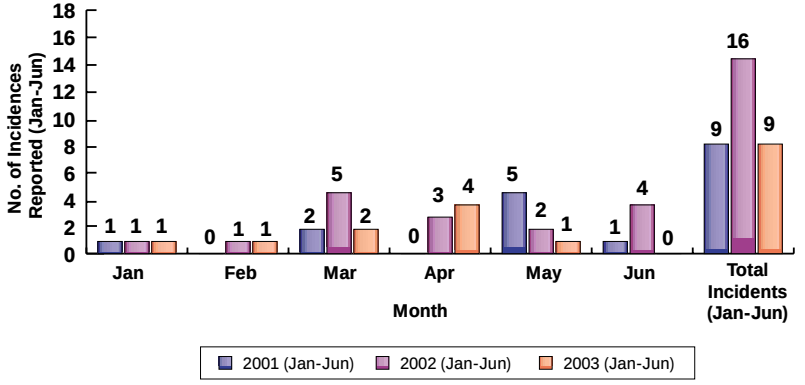
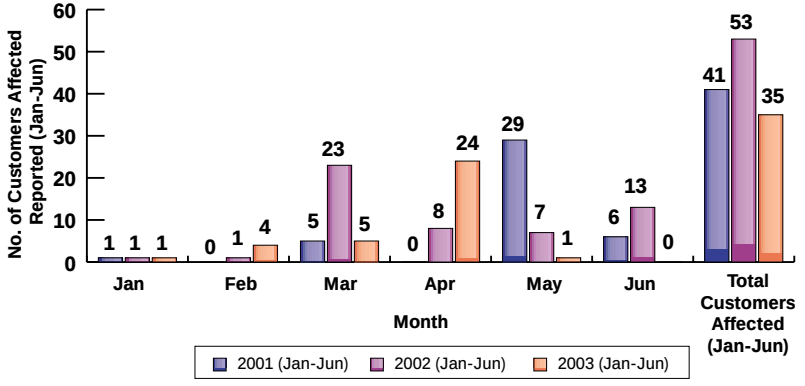


Figure 33 : Number of Customers Affected by Voltage Dips in the First Half Year of 2001, 2002 and 2003



7.0 CONCLUSION

Generally the performance of the electricity supply services in Peninsular Malaysia and Sabah for the first 6 months in 2003 (Jan–June) had improved compared with same period last year. The maximum demand and total sales of electricity by TNB in Peninsular Malaysia, SESB in Sabah and mini utility Nur Distribution Sdn. Bhd. in Kulim Hi –Tech Park had increased compared with the same period of 2002. From the number of voltage dips incidents monitored, the power quality of the grid system appears to have improved.