Suruhanjaya Tenaga

REPORT ON THE PERFORMANCE

Of The Electricity Supply Services In Malaysia

2002

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Report On The Performance Of The Electricity Supply Services In Malaysia

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A. INTRODUCTION

1.0 Introduction

This report provides an insight into the performance of the electricity supply services in Malaysia in the year 2002.

The report contains information and statistics on supply and demand, sales of electricity, power quality, system reliability and supply interruptions. It also compares the prices of electricity in Malaysia with the prices in a few other countries in the region.

The information in the report is based on several sources, such as :

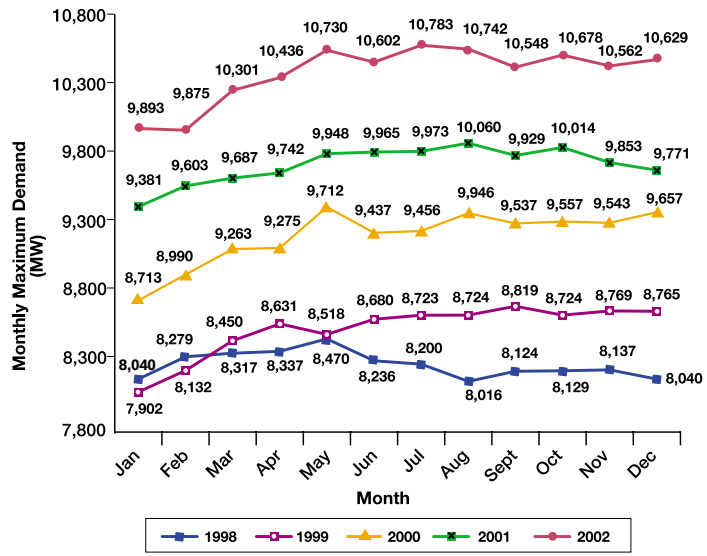
- monthly reports submitted by the utilities
- monthly reports submitted by the Grid System Operator of Peninsular Malaysia
- monthly reports submitted by Independent Power Producers (IPPs)
- complaints received by the Energy Commission
- complaints in local newspapers
- survey on customer satisfaction

2.0 Generation Capacity – Maximum Demand

2.1 Grid System of TNB

In the year 2002, the maximum demand of the grid system in Peninsular Malaysia grew by 7.2% to 10,783 MW from 10,060 MW in year 2001, while the generation capacity increased from 12,680 MW to 13,472 MW. Out of the total installed capacity, 60% or 8,055 MW owned by TNB and the remaining 5,417 MW by the IPP's. The additional generation capacities were 889 MW from 2 new IPPs under construction, i.e. 3 x 143 MW gas turbines from GB3 Power Station in Lumut and 2 x 230 MW gas turbines from Panglima Power Station in Melaka, and another 42 MW from refurbishment of the existing facilities in Genting Sanyen Power Station. The system reserve margin in the year 2002 was in the region of 25%.

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

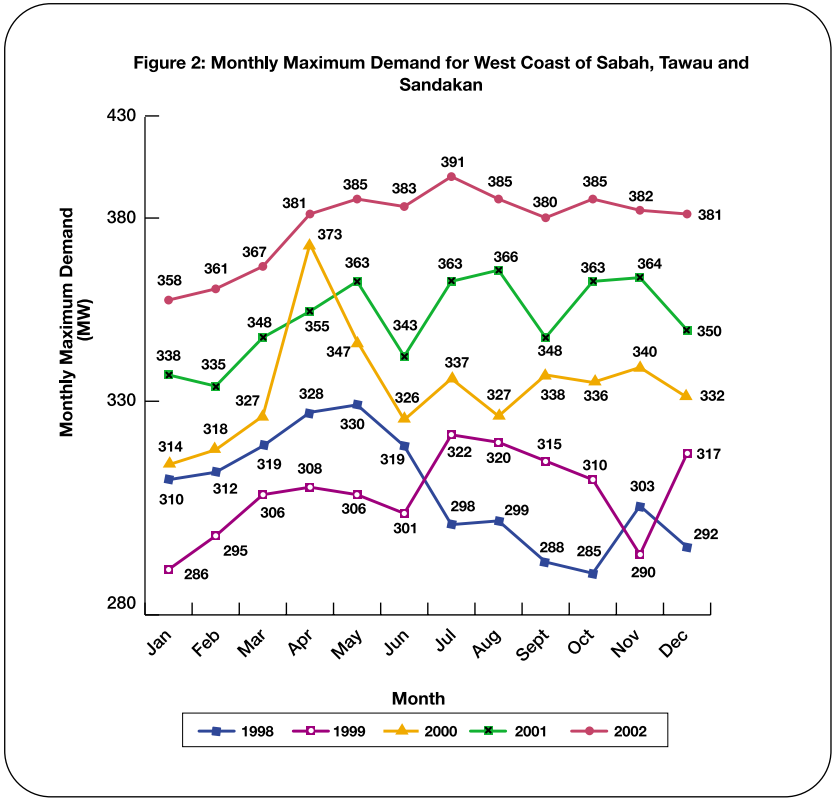


2.2 Grid System of SESB

The sum of the monthly maximum demands of the West Coast grid and in the region of Tawau and Sandakan in Sabah for the year 1998 to 2002 are as shown in figure 2. The maximum demand in the year 2002 was 391 MW which was attained in the month of July 2002. This represents an increase of 6.8% over the 366 MW attained in the year 2001.

The total generation installed capacity in Sabah at the end of December 2002 was 782 MW.

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



N.B. : The three systems in Sabah are not interconnected. The figures shown are summation of the maximum demands of the three systems.

2.3 Grid System of SESCO

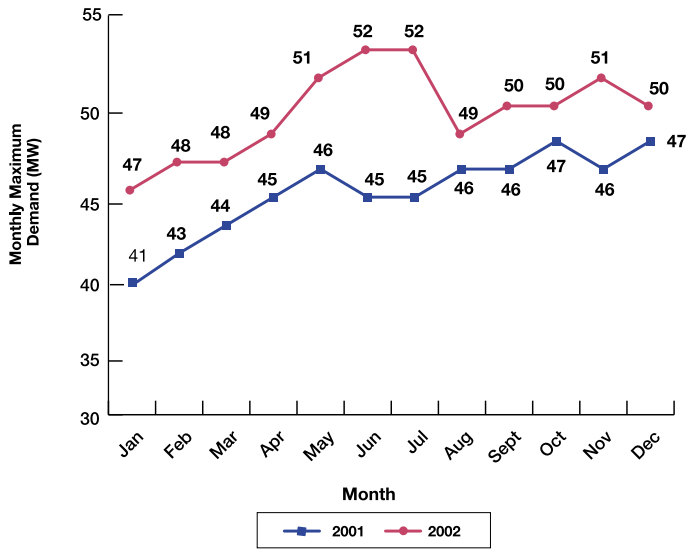
In Sarawak, the maximum demands of the SESCO's grid for the year 2000, 2001 and 2002 were 554 MW, 574 MW and 604 MW respectively. This indicates an increase of 5.2% in year 2002 compared with the previous year.

The total generation capacity in Sarawak in the year 2002 was 867 MW.

2.4 Distribution System of NUR

The maximum demands of the NUR's distribution system in Kulim Hi-Tech Park in the year 2001 and 2002 are as shown in Figure 3. For the year 2002, the maximum demand was 52 MW which was attained in the month of Jun and July. This represents an increase of 10.6% over 47 MW attained in the year 2001. The electricity distributed by NUR in Kulim Hi-Tech Park was purchased by NUR from TNB.

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

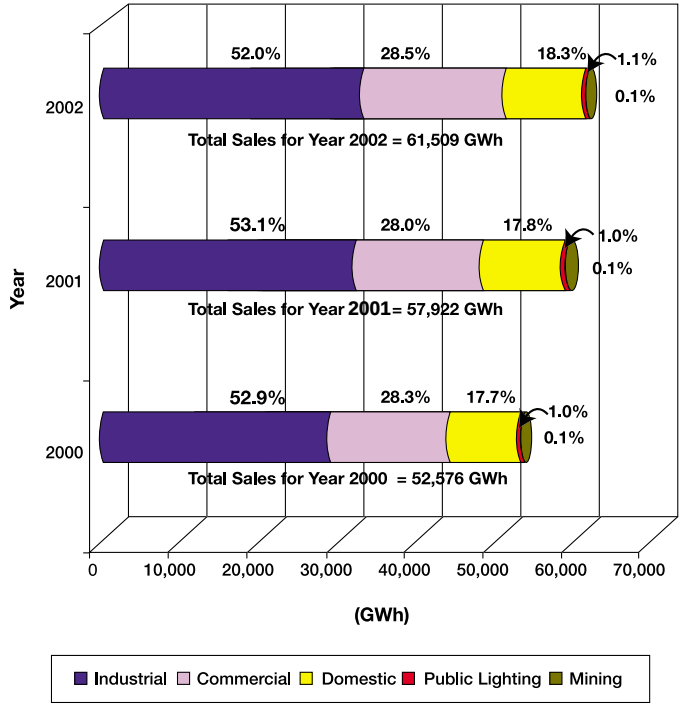


3.0 Sales of Electricity

3.1 Energy Sales of TNB

The statistics of energy sold by TNB to different customer sectors, i.e. domestic, commercial, industrial, mining and public lighting, in the year 2002 and the previous two years are as shown in Figure 4. In the year 2002, the total energy sold by TNB was 61,509 GWh, that is a 6.2% increase over 57,922 GWh sold in the year 2001. The industrial sector consumed the most, i.e. 52.0% of the total sales. This was followed by the commercial, domestic, public lighting and mining sectors with 28.5%, 18.3%, 1.1% and 0.1% respectively. The total number of customers served at the end of the year 2002 was about 5.5 milion.

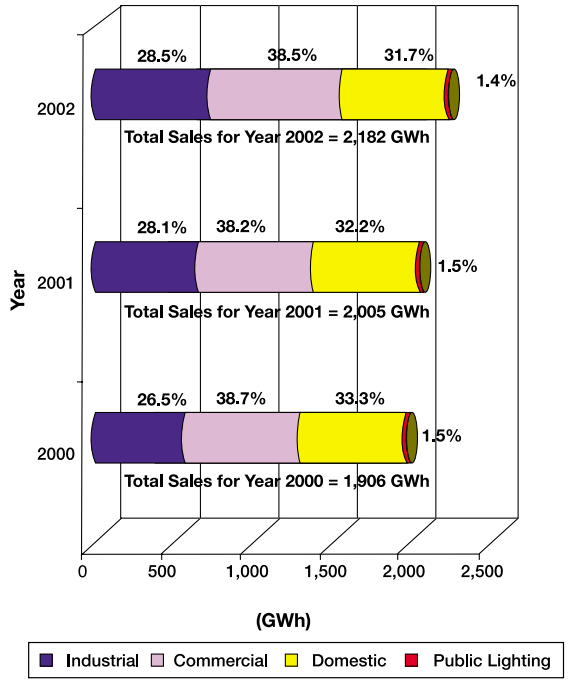
Figure 4: Energy Sales (GWh) of Tenaga National Berhad



3.2 Energy Sales Of SESB

Figure 5 shows the statistics of energy sold by Sabah Electricity Sdn. Bhd. (SESB) for the year 2000, 2001 and 2002. The total energy sold by SESB in the year 2002 was 2,182 GWh, that is about 8.8% increase over 2,005 GWh sold in the year 2001. The commercial sector consumed the most, i.e. 38.5%, followed by the domestic, industrial and public lighting sectors with 31.6%, 28.5% and 8.4% respectively. The total number of customers served at the end of year 2002 was 313,381.

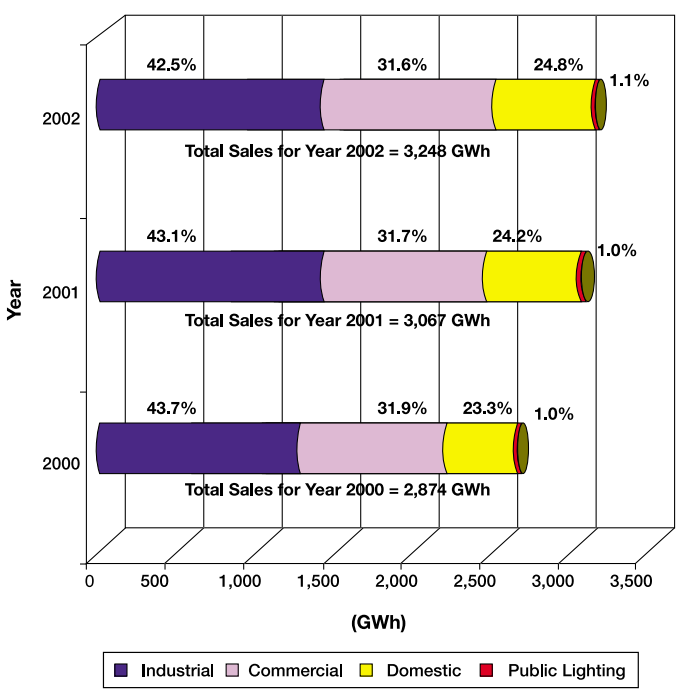
Figure 5: Energy Sales (GWh) Sabah Electricity Sdn. Bhd



3.3 Energy Sales of SESCO

The statistics of energy sold by Sarawak Electricity Supply Corporation (SESCO) for the year 2000, 2001 and 2002 are as shown in Figure 6. For the year 2002, the total energy sold by SESCO was 3,248 GWh, that is a 5.9% increase over 3,067 GWh sold in the year 2001. The industrial sector consumed 42.5% of the total energy sold. This was followed by the commercial, domestic and public lighting sectors with 31.6%, 24.8% and 1.1% respectively. The total number of customers served at the end of year 2002 was 361,545.

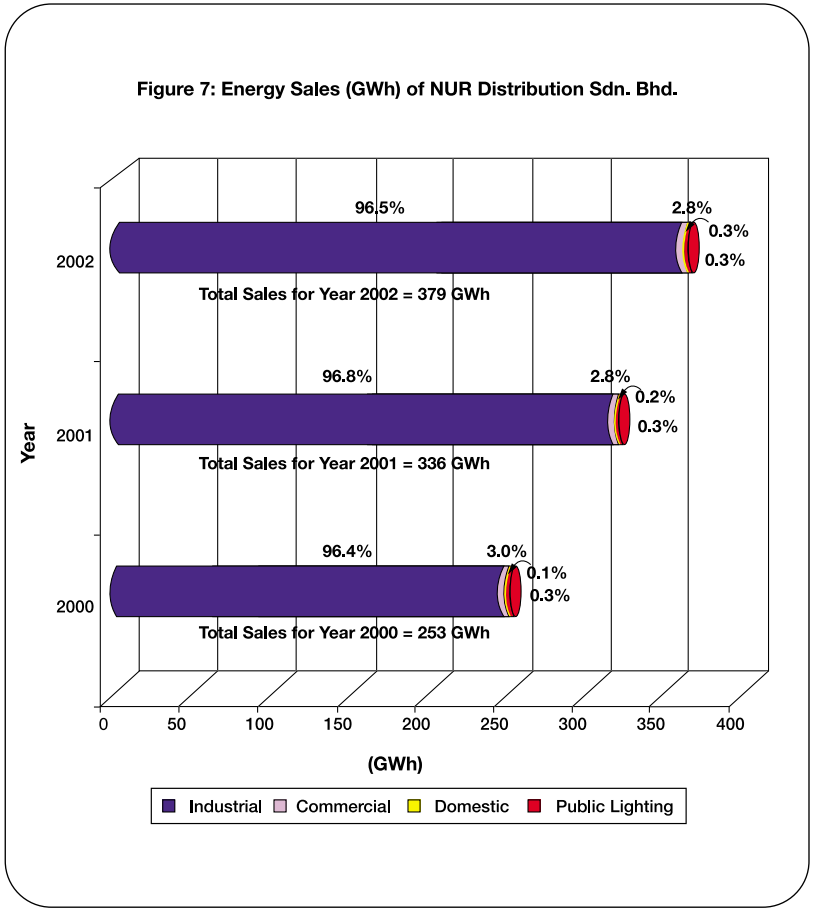
Figure 6: Energy Sales (GWh) of Sarawak Electricity Supply Corporation



3.4 Energy Sales of NUR Distribution

For the year 2002, the total energy sold in Kulim Hi-Tech Park (KHTP) by NUR Distribution Sdn. Bhd. was 379 GWh, that is a 12.8% increase over 336 GWh sold in the year 2001. The industrial sector used 96.5% of the total energy sold. This was followed by the commercial, public lighting and domestic sectors with 2.8%, 0.3% and 0.3% respectively. The total number of customers served at the end of year 2002 was 867.

Figure 7: Energy Sales (GWh) of NUR Distribution Sdn. Bhd.



4.0 Transmission System

The performance of the transmission system are assessed by several indicators such as the delivery point unreliability index (system minutes), loss of supply incidents, unsupplied energy and the number of load sheddings. Table 1 shows the statistics of transmission system trippings with a load loss of 50 MW and above in each tripping in Peninsular Malaysia for the year 2002. Figure 8 shows the number of trippings in the year 2002 in comparison with the previous 3 years.

Table 1 : Statistics of Transmission System Trippings with a Load Loss of 50 MW and above for the year 2002 in Peninsular Malaysia

Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
No. of Trippings	1	1	1	1		1	1	1	2	0	0	0	9
Maximum Load Losses (MW)	84	95	65	69	365	288	288	100	150	0	0	0	1,504
Unsupplied Energy due to Trippings (MWh)	5.6	121.9	115.83	162		128.42	24.5	75	215.3	0	0	0	848.55
Average Unsupplied Energy per Trip (MWh)	5.6	121.9	115.83	162		128.42	24.5	75	107.65	0	0	0	740.9
Average Duration per Trip (Hour)	0:04	1:17	2:36	3:19	5:11	1:30	0:21	1:26	3:38	0	0	0	18:02
No. of Load Sheddings	0	0	0	0	1	0	0	0	0	0	0	0	1
Unsupplied Energy during Load Sheddings (MWh)					544								544

The overall system reliability is related to network planning, design of the system and effectiveness of the security criteria used and normally evaluated by indicators such as delivery point unreliability index (system minutes). As shown in Figure 9, system minutes of TNB had shown a marked reduction from a 4 years average of 40 over the previous 4 years to 20 in the financial year 2002. Nevertheless, there were no significant changes in system minutes for the previous 3 years.

Figure 8: Number of Transmission System Trippings with a Load Loss of 50 MW and Above for the year 2000, 2001 and 2002

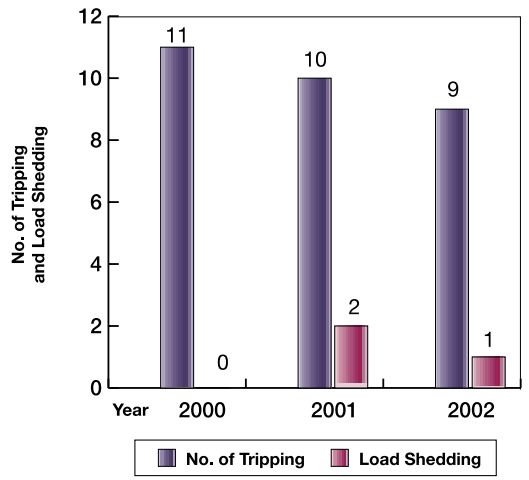
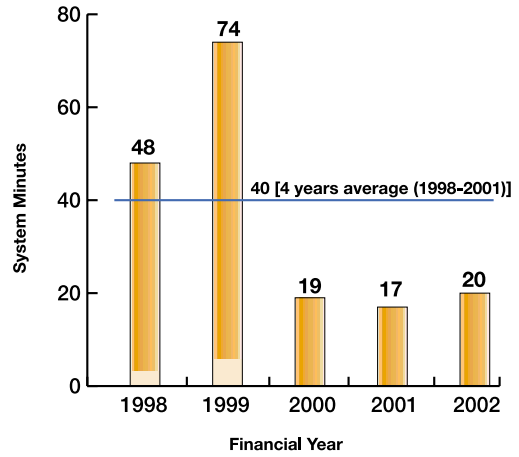


Figure 9: Delivery point Unrealibility Index (System Minutes) of TNB



5.0 Performance of Distribution System

The reliability of the distribution systems in this report is monitored basing on the followings:-

- number of supply interruptions
- duration of supply interruptions
- type of supply interruptions
- causes of supply interruptions
- System Average Interruption Duration Index (SAIDI)
- customer complaints

5.1 Statistics of Supply Interruptions

5.1.1 Statistics of Supply Interruptions of TNB

Figure 10 shows the number and types of supply interruptions on the supply system of TNB in Peninsular Malaysia from the year 1997 to year 2002, while Figure 11 shows the monthly interruptions in the year 2002.

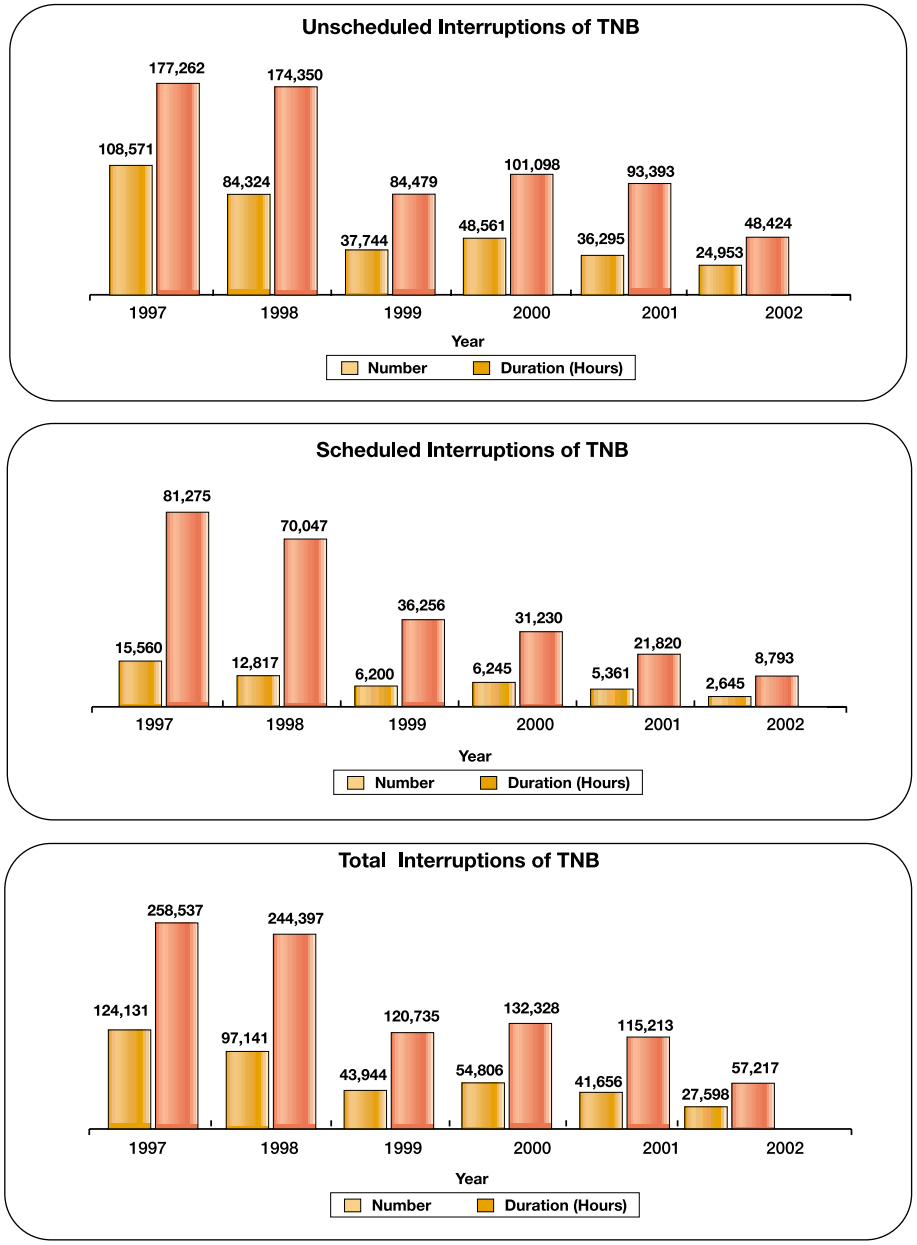
A total of 27,598 interruptions was recorded in the year 2002 on the electricity supply system of TNB with a total duration of 57,217 hours. Comparing with the year 2001, the number and duration of interruptions had decreased by 33.7% and 50.3% respectively. Out of the total number of interruptions, 90.4% was unscheduled interruptions.

Several initiatives have been taken by the utility to reduce the number and duration of supply interruptions and improve the performance of the supply system. Among them are :-

(a) implementing various projects to strengthen the low voltage and high voltage systems of the distribution network such as :-
- changing the bare conductors to insulated aerial bunded conductors (ABC)
- installing new low voltage and high voltage feeders
- constructing new substations

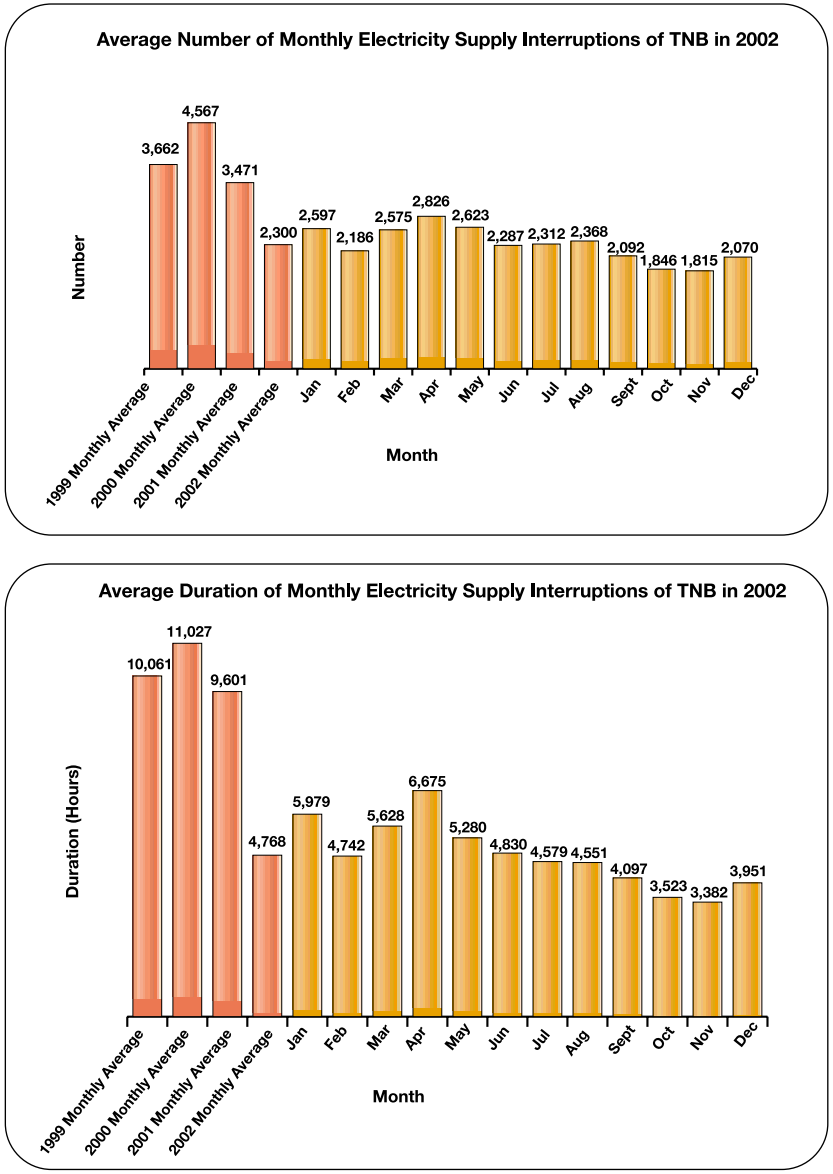
(b) implementing preventive maintenance programmes such as :-
- preventive testing of cables by very low frequency tests
- scheduled preventive maintenance of substations
- condition monitoring of substation equipment, lines and cables

Figure 10 : Electricity Supply Interruptions of TNB from the year 1997 to 2002



D. PERFORMANCE OF DISTRIBUTION SYSTEM

Figure 11 : Monthly Average of Electricity Supply Interruptions of TNB in 2002



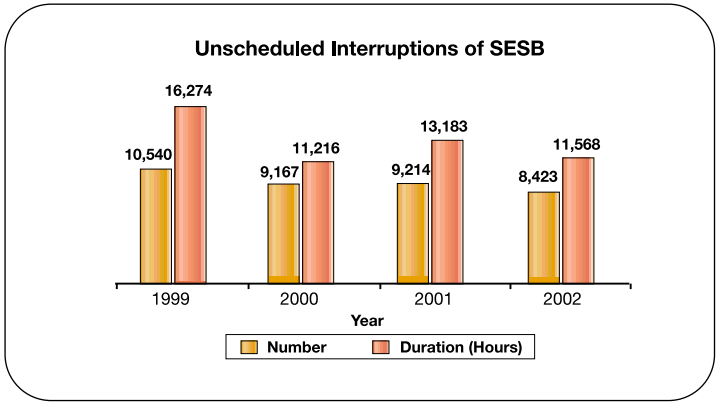
5.1.2 Statistics of Supply Interruptions of SESB

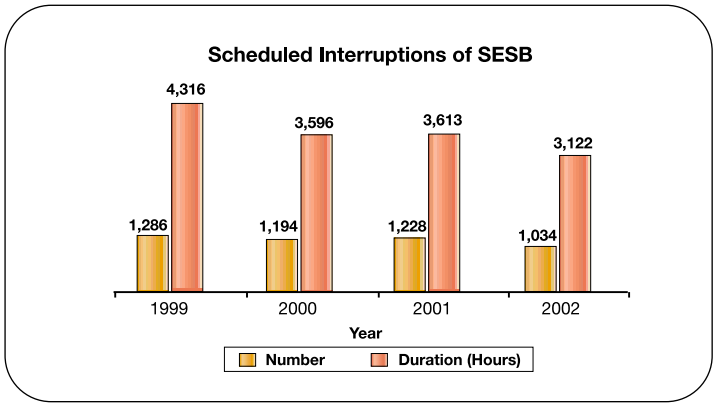
Figure 12 shows the number and types of electricity supply interruptions in Sabah from the year 2000 to 2002, while Figure 13 shows the monthly interruptions in the year 2002.

The number of electricity supply interruptions and the total duration of interruptions for the year 2002 were 9,457 and 14,690 hours respectively. This shows a reduction of 9.4% in number and 12.5% in duration compared with 10,442 incidents and 16,796 hours recorded in the year 2001. Out of the total number of interruptions, 89% was unscheduled interruptions.

D. PERFORMANCE OF DISTRIBUTION SYSTEM

Figure 12 : Electricity Supply Interruptions of SESB for the Year 1999 to 2002





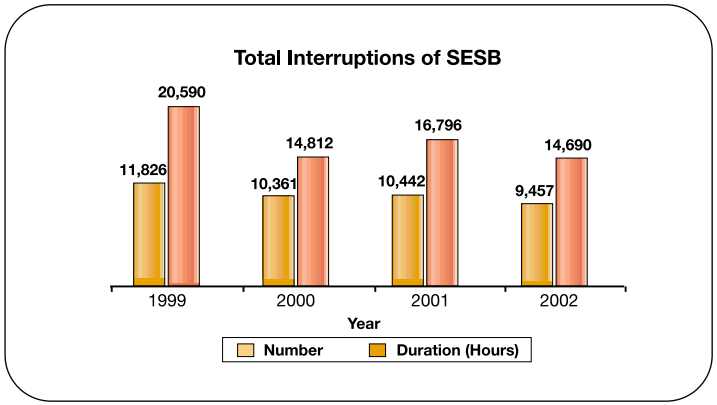
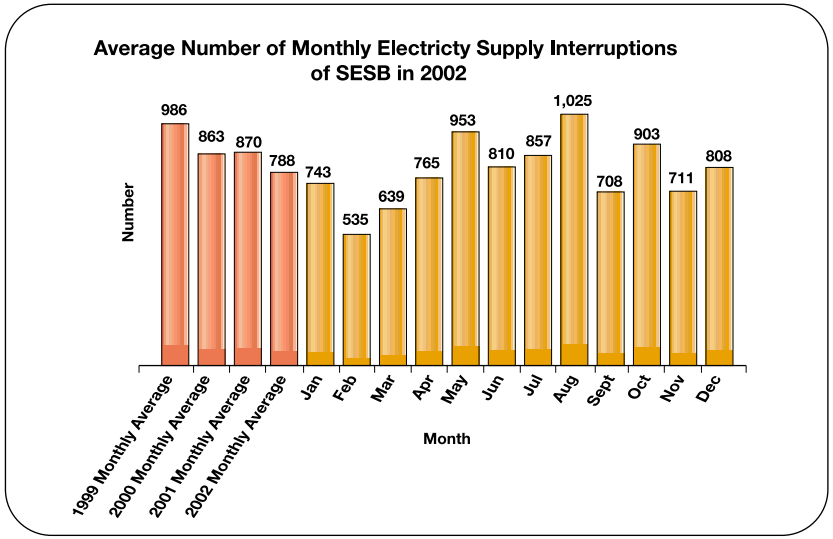
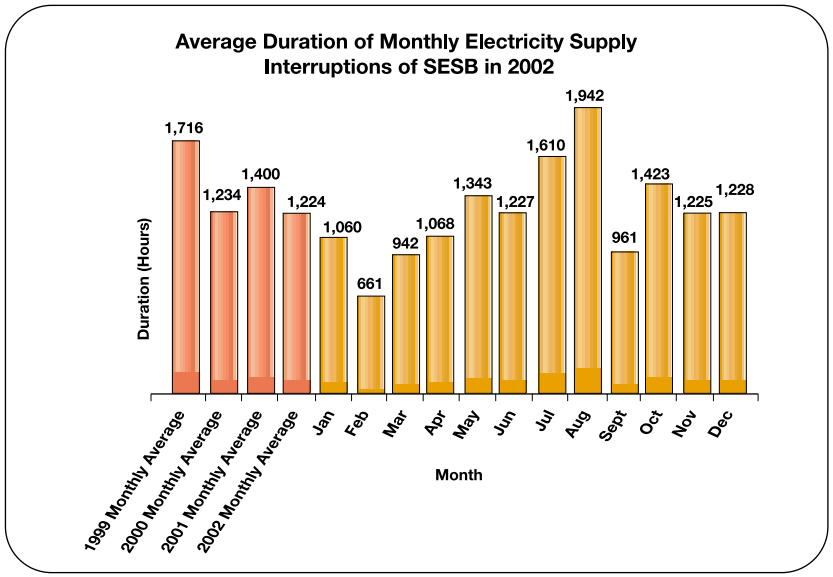


Figure 13 : Monthly Average of Electricity Supply Interruptions of SESB in 2002





D. PERFORMANCE OF DISTRIBUTION SYSTEM

5.1.3 Statistics of Supply Interruptions of SESCO

Table 2 shows the number of electricity supply interruptions in Sarawak from the year 2000 to 2002. The number of interruptions had reduced by 31% from 6,004 in the year 2001 to 4,167 in the year 2002.

Table 2 : Number of Electricity Supply Interruptions of SESCO for the year 2000 to 2002

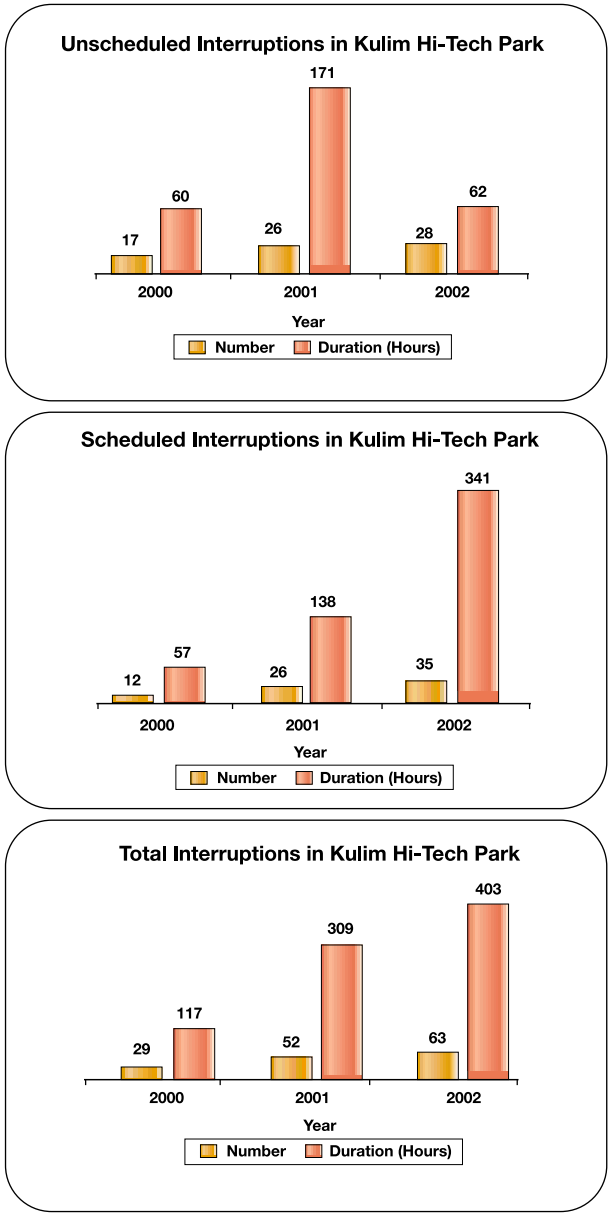
Year	Number of Interruptions
2000	8,145
2001	6,004
2002	4,167

5.1.4 Statistics of Supply Interruptions of NUR Distribution

Figure 14 shows the number and types of electricity supply interruptions in Kulim Hi-Tech Park from the year 2000 to 2002 as reported by NUR Distribution Sdn Bhd, the electricity distributor for the industry park. Figure 15 shows the monthly supply interruptions in the year 2002.

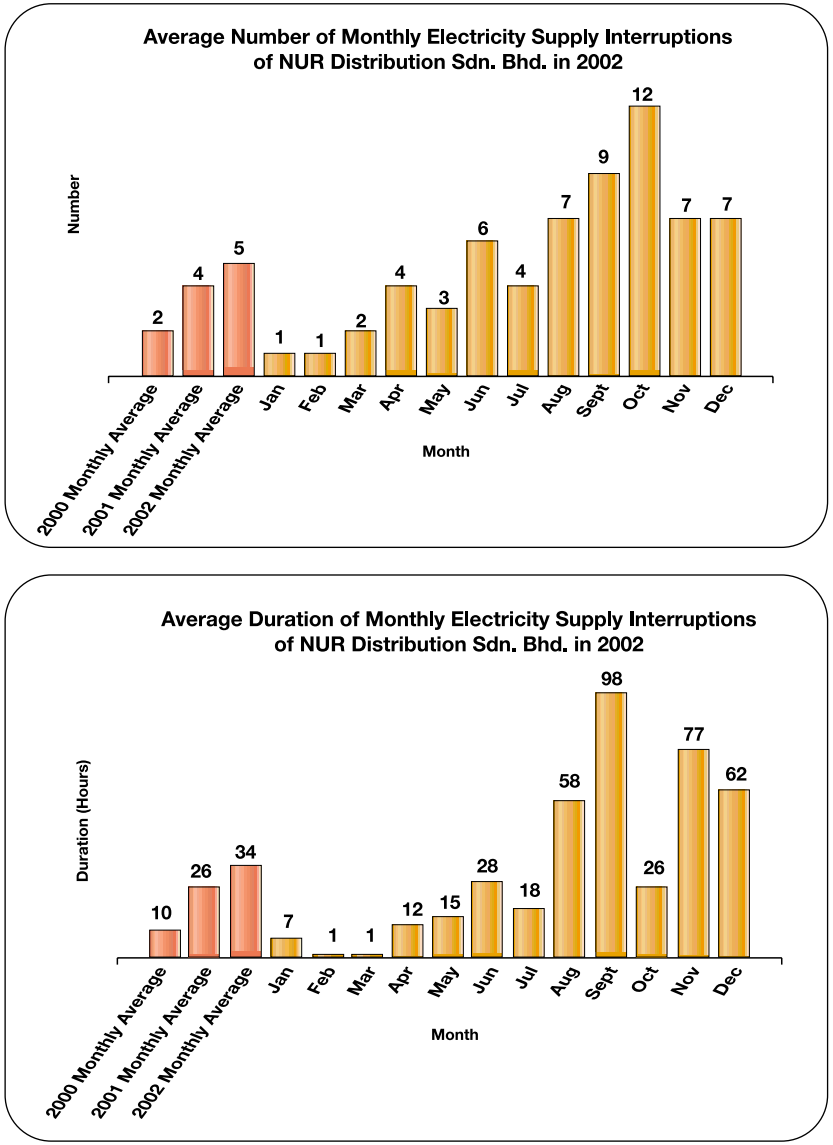
The number of electricity supply interruptions had increased by 21.2% from 52 in the year 2001 to 63 in the year 2002. The total duration of interruptions had also increased by 30.4% from 309 hours to 403 hours in the same period. Out of the total number in the year 2002, about 44.4% was unscheduled interruptions.

Figure 14 : Electricity Supply Interruptions in Kulim Hi-Tech Park Reported by NUR Distribution Sdn. Bhd. for the year 2000 to 2002



D. PERFORMANCE OF DISTRIBUTION SYSTEM

Figure 15 : Monthly Average of Electricity Supply Interruption in Kulim Hi-Tech Park reported by NUR Distribution Sdn. Bhd. for the year 2002



5.2 System Average Interruption Duration Index (SAIDI)

5.2.1 SAIDI of TNB

Figure 16 shows the System Average Interruption Duration Index (SAIDI) of TNB in Peninsular Malaysia for the year 2001 and 2002.

In the year 2002, with the exception of Negeri Sembilan, Pahang dan Terengganu, the SAIDI for other states in Peninsular Malaysia had reduced, indicating an improvement on the performance of the supply system compared with the year 2001. The overall SAIDI of TNB reduced from 266 minutes in the year 2001 to 128 minutes in the year 2002, a 52% improvement in the year 2002 over the previous year.

For the industrial customers, the SAIDI had dropped from 43 minutes in the year 2001 to 21 minutes in the year 2002 as shown in Figure 17.

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Figure 16: SAIDI (Minutes/Customer/Year) for the States in Peninsular Malaysia for the year 2001 and 2002

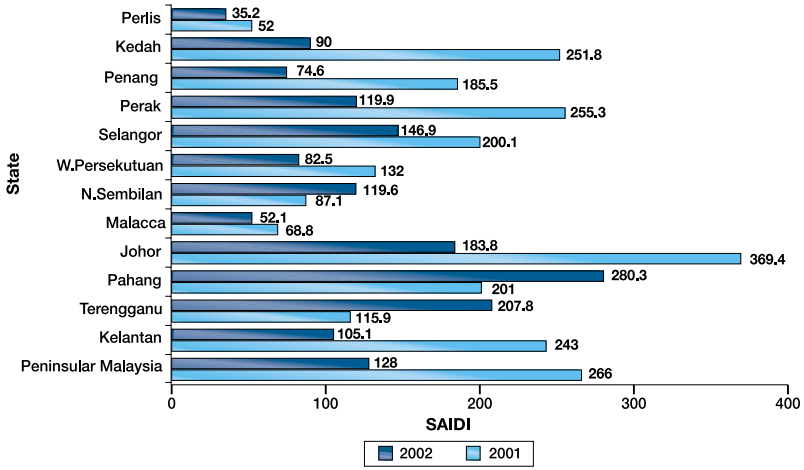
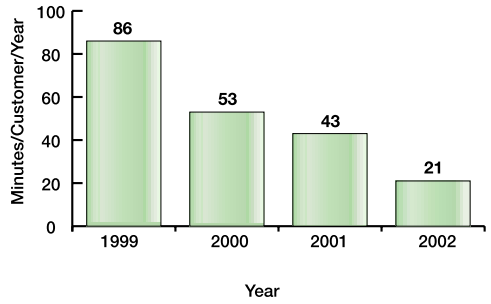


Figure 17 : SAIDI of TNB Industrial Areas (Year 1999 to 2002)

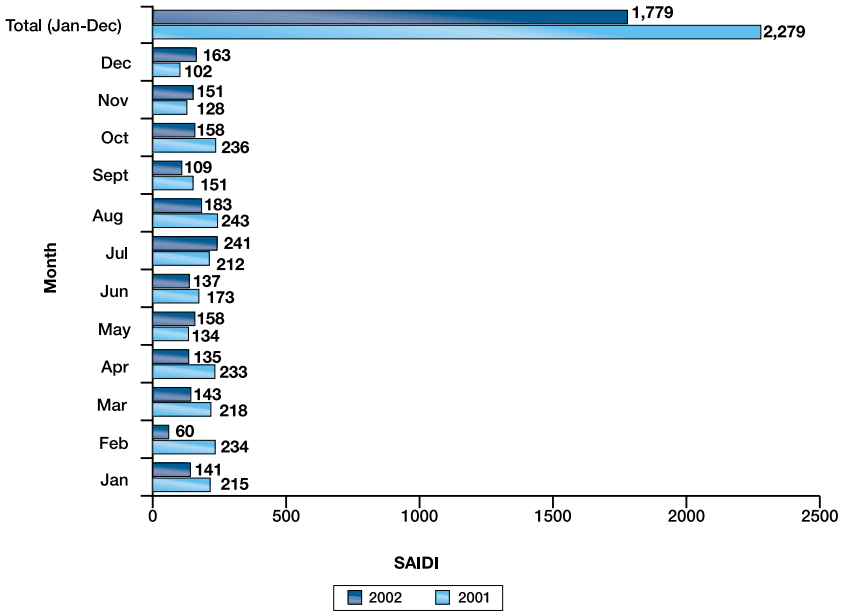


5.2.2 SAIDI of SESB

In Sabah, the electricity supply performance had improved with the SAIDI decreased to 1,779 minutes in the year 2002 from 2,279 minutes in the year 2001 an improvement of 22%.

The SAIDI of SESB for the year 2001 and 2002 are as shown in Figure 18.

Figure 18: SAIDI (Minutes/Customer/Year) for the state of Sabah for the Year 2001 and 2002



5.2.3 SAIDI of SESCO

Table 3 shows the SAIDI of the SESCO in the year 2000 to 2002. The performance of SESCO in Sarawak in the year 2002 had improved compared with the year 2001 with SAIDI reduced from 731 minutes to 610 minutes.

Table 3 : SAIDI of SESCO for the Year 2000 to 2002

Year	SAIDI
2000	859
2001	731
2002	610

5.2.4 SAIDI of NUR Distribution

Table 4 shows the SAIDI in Kulim Hi-Tech Park in the year 2000, 2001 and 2002, while Figure 19 shows the monthly figures in the year 2002. The performance of NUR Distribution in the year 2002 had improved with the SAIDI reduced by 70% from 627 minutes in the year 2001 to 189 minutes in the year 2002. Nevertheless, this figure is still comparatively high for a high technology industrial park.

Table 4 : SAIDI of NUR Distribution Sdn. Bhd. for the Year 2000 to 2002

Year	SAIDI
2000	177
2001	627
2002	189

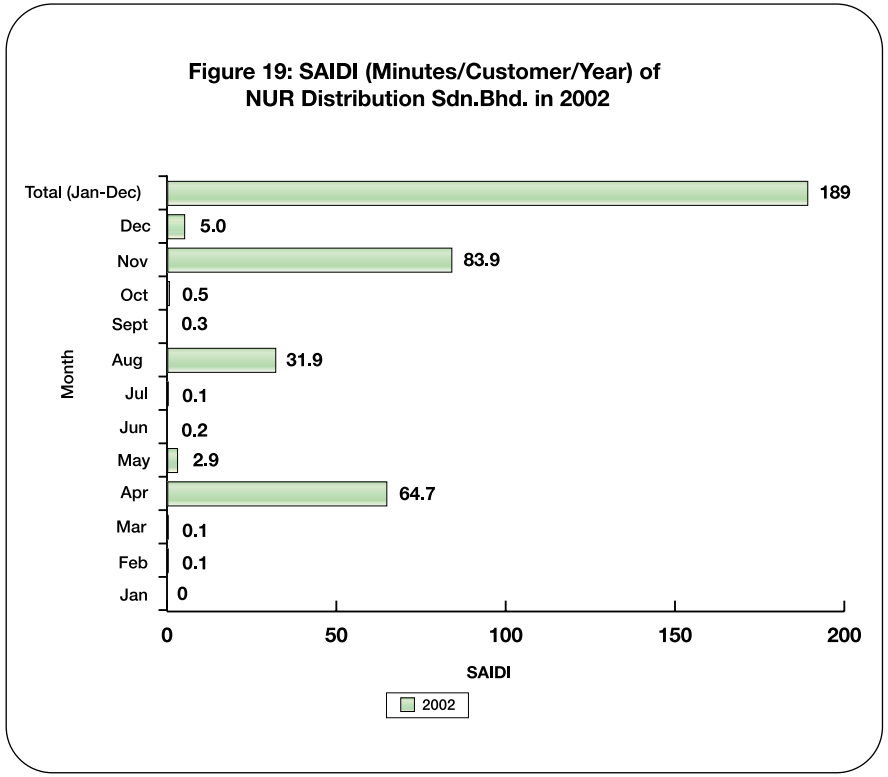


Figure 19: SAIDI (Minutes/Customer/Year) of NUR Distribution Sdn.Bhd. in 2002

D. PERFORMANCE OF DISTRIBUTION SYSTEM

Table 5 shows the SAIDI of TNB, SESB, SESCO and NUR for the last 3 years, that is, 2000, 2001 and 2002. The SAIDI of several utilities in other countries are also included for comparison. It can be seen, in general, the SAIDI of the utilities in Malaysia decreased significantly in the previous few years.

Table 5 : SAIDI for the supply system of TNB, SESB, NUR and Other Utilities

Utilities	Year	SAIDI (Minutes/Customer/Year)
TNB (Peninsular Malaysia)	1998 1999 2000 2001 **2002**	600 364 330 266 **128**
SESB (Sabah)	1999 2000 2001 **2002**	3,008 2,048 2,279 **1,779**
SESCO (Sarawak)	2000 2001 **2002**	859 731 **610**
NUR	2000 2001 **2002**	177 627 **189**
Victoria, Australia	2000 2001	157 152
South Australia	2001 **2002**	168 **148**
Metropolitan Electricity Authority, Thailand	1999 2000	72 66
Provincial Electricity Authority, Thailand	1999 2000	1,298 1,188
United Kingdom (England & Wales)	1999 2000	81 71

5.3 Causes of Electricity Supply Interruptions

5.3.1 Causes of Interruptions - TNB

Table 6 shows the main causes of unscheduled electricity supply interruptions in Peninsular Malaysia from the year 1998 to 2002, while Figure 20 shows the causes of unscheduled interruptions in the year 2002.

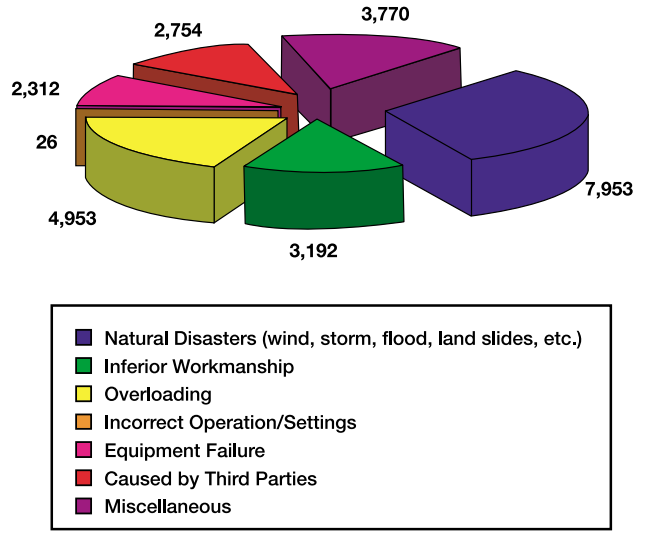
Table 6 : Causes of Unscheduled Electricity Supply Interruptions in Peninsular Malaysia from the Year 1998 to 2002

Unscheduled Causes of Interruptions	Number of Interruptions				
	1998	1999	2000	2001	2002
Natural Disasters(wind, storm, flood, land slides, etc.)	31,264 (37.1%)	14,687 (38.9%)	18,268 (37.6%)	13,914 (38.5%)	7,953 (31.9%)
Inferior Workmanship	5,305 (6.3%)	5,429 (14.4%)	6,198 (12.8%)	5,038 (13.9%)	3,192 (12.8%)
Overloading	13,478 (16.0%)	4,372 (11.6%)	5,106 (10.5%)	4,243 (11.7%)	4,953 (19.8%)
Incorrect Operation/Settings	345 (0.4%)	128 (0.3%)	91 (0.2%)	72 (0.2%)	26 (0.1%)
Equipment Failure	16,299 (19.3%)	5,265 (13.9%)	8,582 (17.7%)	5,798 (16.0%)	2,312 (9.3%)
Caused by Third Parties	5,474 (6.5%)	2,670 (7.1%)	4,050 (8.3%)	3,045 (8.4%)	2,754 (11.0%)
Miscellaneous	12,159 (14.4%)	5,210 (13.8%)	6,271 (12.9%)	4,021 (11.1%)	3,770 (15.1%)
Total	84,324	37,761	48,566	36,131	24,960

D. PERFORMANCE OF DISTRIBUTION SYSTEM

From the table, it can be seen that in the year 2002, 31.9% of the unscheduled electricity supply interruptions were related to weather. This was followed by overloading, miscellaneous causes, inferior workmanship, damage by third parties, equipment failure and incorrect operation/setting at 19.8%, 15.1%, 12.8%, 11.0%, 9.3% and 0.1% respectively.

Figure 20: Causes of Unscheduled Electricity Supply Interruptions in Peninsular Malaysia for the Year 2002



5.3.2 Causes of Interruptions - SESB

The causes of unscheduled electricity supply interruptions in SESB's system from the year 1999 to 2002 are as shown in Table 7, and Figure 21 shows the causes of interruptions in the year 2002.

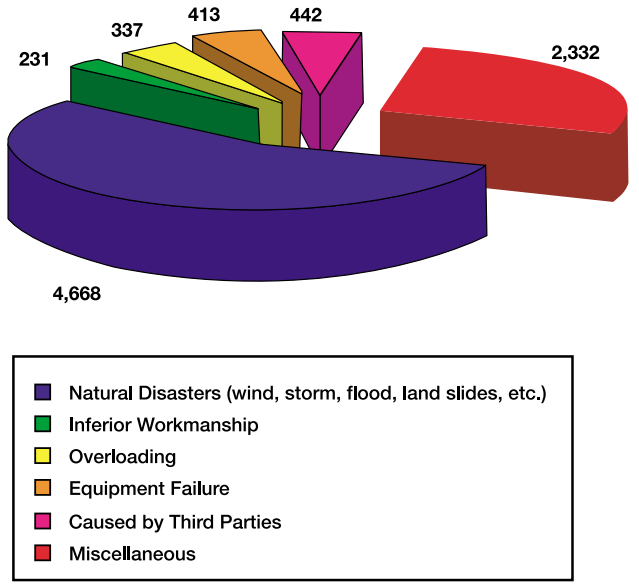
Table 7 : Causes of Unsheduled Electricity Supply Interruptions in SESB's system from the Year 1999 to 2002

Unscheduled Causes of Interruptions	Number of Interruptions			
	1998/99	2000	2001	2002
Natural Disasters (wind, storm, flood, land slides, etc.)	4,874 (42.8%)	6,242 (68.1%)	5,935 (64.4%)	4,668 (55.4%)
Inferior Workmanship	113 (1.0%)	986 (10.8%)	718 (7.8%)	231 (2.7%)
Overloading	1,349 (11.8%)	196 (2.1%)	339 (3.7%)	337 (4.0%)
Equipment Failure	3,453 (30.3%)	439 (4.8%)	564 (6.1%)	413 (4.9%)
Caused by Third Parties	470 (4.1%)	348 (3.8%)	432 (4.7%)	442 (5.2%)
Miscellaneous	1,154 (10%)	956 (10.4%)	1,226 (13.3%)	2,332 (27.7%)
Total	11,413	9,167	9,214	8,423

D. PERFORMANCE OF DISTRIBUTION SYSTEM

From the table, it can be seen that in the year 2002, 55.4% of the unscheduled electricity supply interruptions were due to nature related events. This was followed by miscellaneous causes, damage by third parties, equipment failure, overloading and inferior workmanship at 27.7%, 5.2%, 4.9%, 4.0% and 2.7% respectively.

Figure 21 : Causes of Unscheduled Electricity Supply Interruptions in Sabah for the Year 2002



5.3.3 Causes of Interruptions - Other Electricity Distributors

The statistics of unscheduled electricity supply interruptions for the year 2001 and 2002 as reported by other electricity distribution licensees, apart from TNB and SESB, are as shown in Table 8.

Table 8 : Unscheduled Electricity Supply Interruptions Reported by Electricity Distribution Licensees Apart from TNB and SESB for the Year 2001 and 2002

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	2002	2001	2002	2001	2002	2001	2002	2001	2002
Natural Disasters (wind, storm, flood, land slides, etc.)	1	0	0	0	0	0	0	0	0	0
Equipment Failure	2	0	0	0	0	0	0	0	12	9
Overloading	0	0	0	0	0	0	0	0	7	4
Incorrect Operation/Settings	0	0	1	0	0	0	0	0	2	1
Inferior Workmanship	0	0	0	0	0	0	0	0	1	9
Caused by Third Parties	1	0	0	1	0	0	0	0	2	3
Miscellaneous	0	2	0	0	0	0	7	7	2	2
Total Number	4	2	1	1	0	0	7	7	26	28
Total Duration (Hours)	**100**	**0.2**	**1.4**	**1.1**	**0**	**0**	**14.0**	**4.4**	**171**	**63**

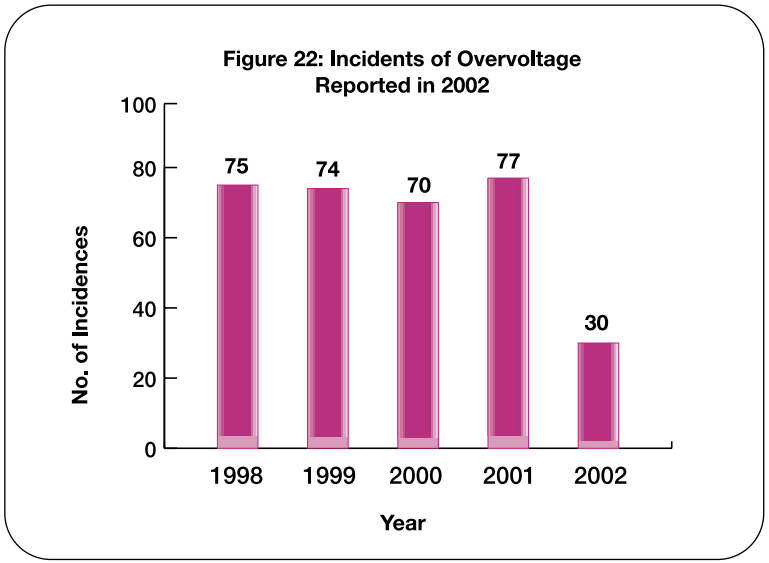
6.0 Quality of Supply

Quality of supply is a measure of the supply characteristics received by the consumers. The performance is normally assessed by the incidents of voltage or frequency distortions exceeding the prescribed limits.

In this report, the quality of supply is evaluated basing on the complaints of consumers on overvoltage or power quality problem and power quality monitoring carried by TNB in several major industrial areas in Peninsular Malaysia.

6.1 Incidents of Overvoltage

In the year 2002, the number of overvoltage incidents in Peninsular Malaysia reported to the Commission was 30 compared with 77 in the year 2001 as shown in Figure 22. This shows a 61% reduction in the number of incidents.



6.2 Power Quality Problems

6.2.1 Voltage Dips in the Areas of Supply of TNB

Most power quality problems are related to voltage dips. Voltage dips are due to various causes such as fault on the supply system, connection or switching of large load, system transient, lightning and others. Such incidents often cause interruptions to the industries with sensitive equipment or processes.

Figure 23 and 24 show the number of voltage dips and number of consumers affected in the major industrial areas in Peninsular Malaysia for the year 2001 and 2002. The major industrial areas monitored were as follows :-

- Pulau Pinang Industrial Areas (Bayan Lepas, Bayan Baru, Prai).
- Melaka Industrial Areas (Batu Berendam, Krubong, Tangga Batu).
- Gebeng Industrial Area, Pahang.
- Kemaman Industrial Area, Terengganu.
- Kelantan Industrial Area (Pengkalan Chepa).
- Bemban Industrial Area, Perak.
- Pasir Gudang Industrial Area, Johor.
- Negeri Sembilan Industrial Areas (Tunku Jaafar, Chembong).
- Selangor Industrial Areas (Sabak Bernam, Rawang, Shah Alam, Bukit Raja, Banting).

In the year 2002, the number of voltage dips monitored and the number of consumers affected were 147 and 242 respectively compared with 148 and 268 in the year 2001. This shows that the number of incidents and the number of consumers affected had dropped 0.7% and 9.7% respectively.

In order to reduce the power quality problems, the utilities, in particular TNB, have taken several initiatives focussing on :-

- investigation of power quality problems and rendering advisory services to the affected consumers
- development of power quality monitoring system
- implementation of power quality mitigation measures
- education and training

D. PERFORMANCE OF DISTRIBUTION SYSTEM

Figure 23: Number of Voltage Dips Reported in Major Estates in Peninsular Malaysia in the Year 2001 and 2002

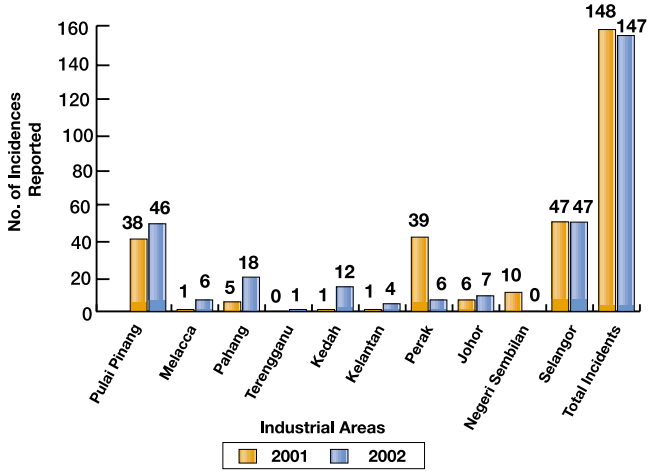
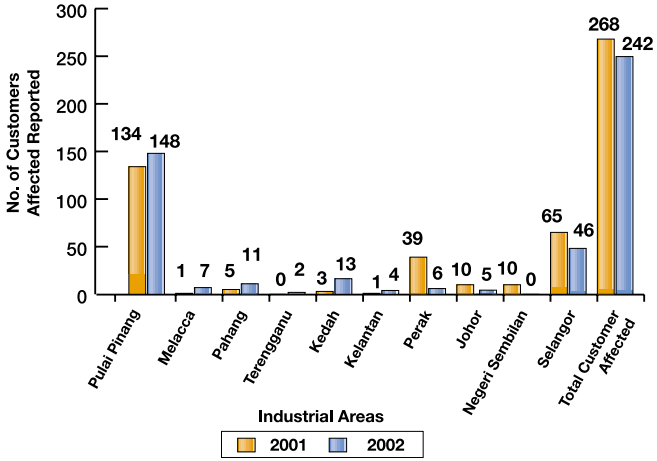


Figure 24: Number of Customers Affected by Voltage Dips in the Year 2001 and 2002



6.2.2 Voltage Dips in Kulim Hi-Tech Park

Figure 25 and 26 show the number of voltage dips and the number of consumers affected in Kulim Hi-Tech Park as reported by NUR Distribution Sdn. Bhd. in the year 2001 and 2002.

The number of voltage dips and the number of consumers affected in the year 2002 were 35 and 64 respectively, compared with 27 and 95 in the year 2001. This shows a 29.6% increase in the number of incidents over the year 2001. Majority of the incidents was due to faults or trippings on the transmission system outside NUR's supply area.

D. PERFORMANCE OF DISTRIBUTION SYSTEM

Figure 25: Number of Voltage Dips Reported by NUR Distribution Sdn. Bhd. in the Year 2001 and 2002

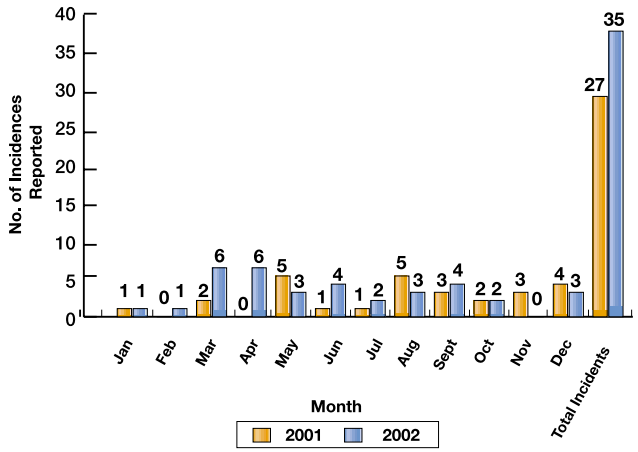
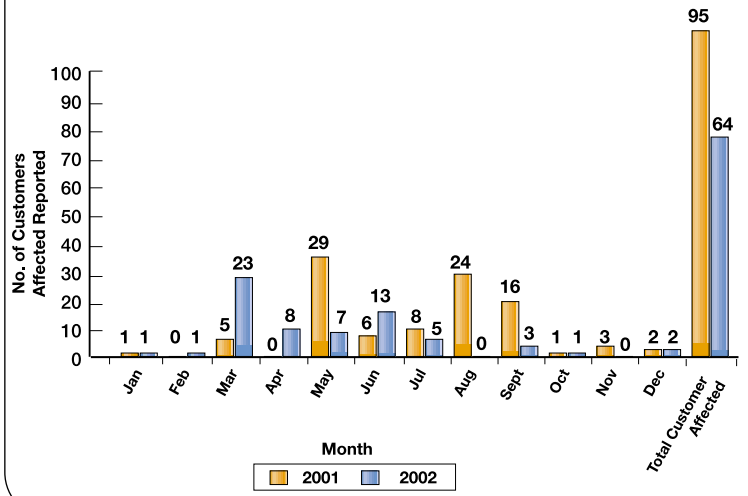


Figure 26: Number of Customers Affected by Voltage Dips in the Year 2001 and 2002



7.0 Quality of Service

In this report the quality of service of the electricity supply utilities was assessed basing on the annual performance reports submitted by the utilities, consumer's complaints and survey on customer satisfaction carried out.

7.1 Annual Performance Report on Customer Services

TNB and SESB are required to submit annual reports on performance of customer services to the Energy Commission. The reports outline the performance of the utilities in 15 types of services. Based on the report submitted (as in Appendix I and II), it can be seen that the overall performance in customer services of both utilities had improved.

7.2 Complaints Received by the Energy Commission

In the year 2002, a total of 47 complaints were received by the Energy Commission through its regional offices and headquarters. Most of the complaints were regarding connection charge, application or disconnection of supply, electricity billing, damage on installation by third party, supply interruption and service provided. With discussions with the utilities, most of the issues were resolved. Table 9 shows the number and type of complaints received by the Energy Commission in the year 2002.

Table 9 : Number and Types of Complaints Received by The Energy Commission in the year 2002

No.	Complaints Category	No. of Complaints 2002
1.	Electricity interruptions	13
2.	Electricity bill	6
3.	Tariff	0
4.	Connection charges/ other charges	7
5.	Customer services	2
6.	Electricity supply quality	2
7.	Application/disconnection of electricity supply	6
8.	Other matter with regards to TNB	8
9.	Damage to TNB installations by third parties	1
10.	Miscellaneous	2
	Total	**47**

E. QUALITY OF SERVICE

7.3 Customer Satisfaction Survey by the Energy Commission

The Energy Commission, as in the previous years, had carried out survey in the year 2002 to gauge the level of customer satisfaction with regard to the supply and services of the main utilities, in particular TNB and SESB. The survey involved domestic, commercial and industrial customers and was carried out with the co-operational of various trade associations such as Federation of Manufactures of Malaysia (FMM). A total of 858 responses were received throughout the Peninsula and Sabah.

7.3.1 Performance of TNB

About 66% of the customers responded was satisfied with the supply and services of TNB, while 24% had indicated otherwise. The commercial customers showed the highest satisfaction level (69.3%) followed by domestic customers (66.6%) and industrial customers (63%). Table 10 shows the summary of the results of the customer satisfaction survey according to the activities and customer sectors of TNB.

Table 10 : Percentage of Customers Satisfied with the Services of TNB

Activities	Percentage of Customers Satisfied with the Services			
	Overall	Industrial	Commercial	Domestic
Reliability and quality of supply	63.4%	60.2%	70.5%	61.9%
Meter reading, billing and refund of deposit	**74.3%**	**74.1%**	**75.8%**	**73.3%**
Notice of electricity supply interruptions	70.3%	72.8%	71.9%	66.0%
Application of connection/reconnection and timeliness of connection/reconnection of supply	71.4%	70.1%	72.8%	71.5%
Handling of breakdown complaint and time taken for restoration of supply	63.5%	56.3%	66.3%	69.7%
Tariff dan charges	54.9%	46.6%	53.8%	66.5%
Condition of utility's supply lines and equipment and street lighting	60.4%	58.1%	69.5%	54.5%
Advice and customer education	44.7%	29.1%	49.1%	58.7%

7.3.2 Performance of SESB

About 56.1% of the customers responded was satisfied with the supply and services of SESB, while 27.1% had indicated otherwise. The satisfaction level of the commercial customers was the highest at (58.3%) followed by the domestic customers at (46.7%) and the industrial customers at (45.9%). Table 11 shows the summary of the results of the customer satisfaction survey of SESB according to the activities and customer sectors.

Table 11 : Percentage of Customers Satisfied with the Services of SESB

Activities	Percentage of Customers Satisfied with the Services			
	Overall	Industrial	Commercial	Domestic
Reliability and quality of supply	52.8%	32.9%	57.3%	50.0%
Meter reading, billing and refund of deposit	**65.7%**	**66.9%**	65.8%	50.0%
Notice of electricity supply interruptions	57.8%	45.2%	59.7%	**75.0%**
Application of connection/reconnection and timeliness of connection/reconnection of supply	52.0%	37.4%	54.9%	50.0%
Handling of breakdown complaint and time taken for restoration of supply	63.8%	48.1%	**67.5%**	25.0%
Tariff dan charges	44.6%	21.4%	48.7%	50.0%
Condition of utility's supply lines and equipment and street lighting	55.9%	55.7%	56.1%	50.0%
Advice and customer education	25.0%	7.1%	29.2%	0%

8.0 Electricity Prices

The average electricity prices of TNB, SESB and SESCO in the year 2002 were 23.5 sen/kWh, 25.5 sen/kWh and 26.6 sen/kWh respectively.

Since 1997, the Government has fixed the gas price for the power sector in Malaysia at RM6.40/mmbtu. As about 80% of the electricity in Peninsular Malaysia was generated using natural gas, this had helped to reduce the impact of fluctuation of market price of fuel on the cost of generating of electricity.

8.1 Electricity Prices of TNB, SESB and SESCO

The average electricity prices of TNB, SESB and SESCO in year 2002 in comparison with the prices in a few other countries in the region are as shown in Table 12 and Figures 27 to 31.

The average price was derived from the total units of energy sold and the total revenue from the sales of electricity. However, comparison of competitiveness of the prices of electricity should not be basing on prices alone but also on the other related factors such as quality of supply and services, GDP and the buying power of the customers. Considering all these factors, the prices of electricity in Malaysia are competitive.

Table 12 : Prices of Electricity in Malaysia and Other Countries in the Year 2002

Utility/ Country	Domestic (Sen/kWh)	Commercial (Sen/kWh)	Industrial (Sen/kWh)	Public Lighting (Sen/kWh)	Overall (Sen/kWh)
TNB	23.3	27.8	21.4	15.3	23.5
SESB	22.8	29.3	23.3	30.3	25.5
SESCO	31.6	32.1	19.1	47.1	26.6
Singapore***	32.8	32.8	27.9	-	32.3
Thailand***	24.9	25.8	22.0	-	23.4
Philippines***	39.3	39.9	35.1	38.7	38.3
Korea****	27.4	30.3	18.5	20.6	23.2
Hong Kong*	42.2	47.2	32.7	-	42.9
Taiwan**	27.2	27.7	19.3	10.8	22.7

* for January 2002 only
** January to July 2002
*** January to October 2002
**** January to November 2002

Figure 27 : Comparison of Prices of Electricity for Domestic Customers in the Year 2002

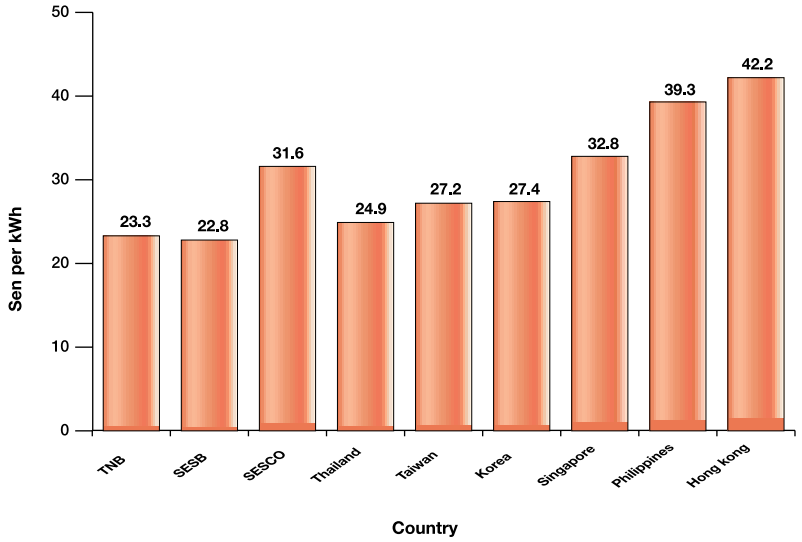


Figure 28 : Comparison of Prices of Electricity for Commercial Customers in the Year 2002

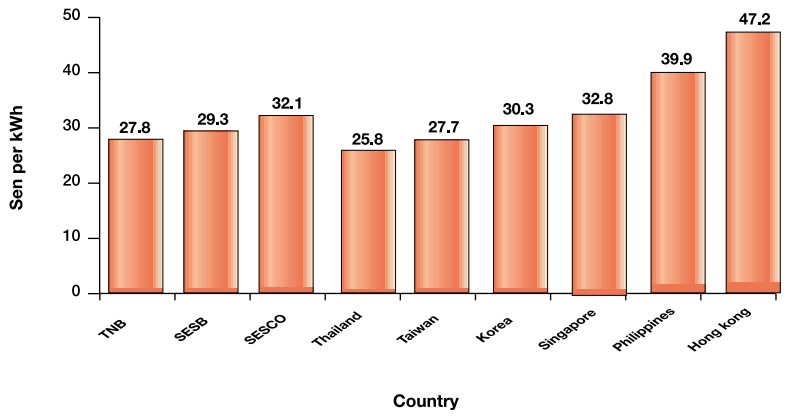


Figure 29 : Comparison of Prices of Electricity for Industrial Customers in the Year 2002

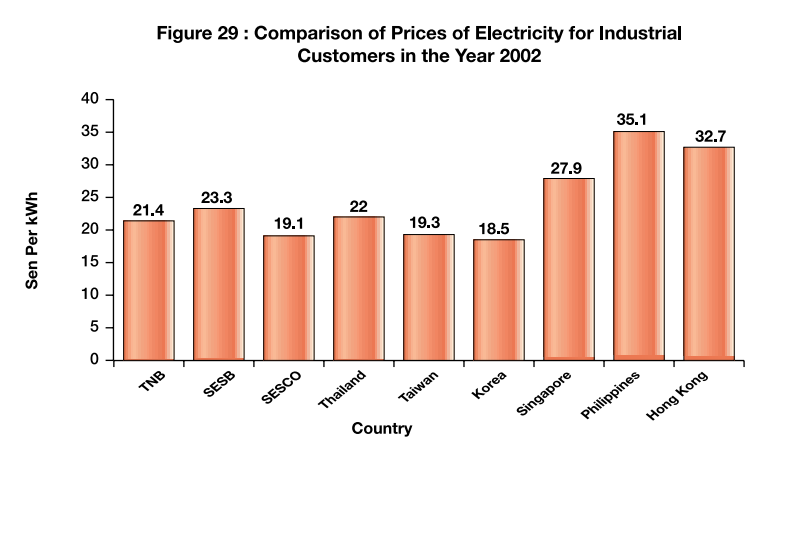
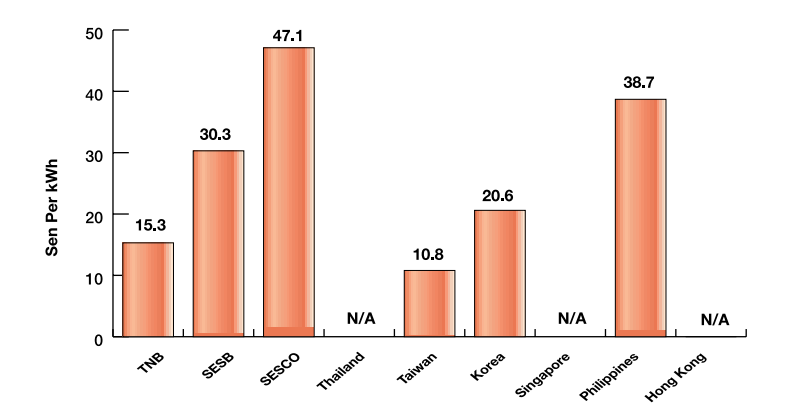


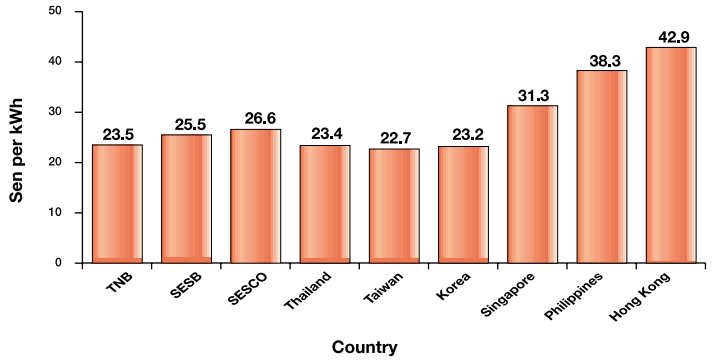
Figure 30 : Comparison of Prices of Electricity for Street Lighting in the Year 2002



Note : N/A : Not Applicable

F. ELECTRICITY PRICES

Figure 31 : Comparison of Average Prices of Electricity in Malaysia and Other Countries in the Year 2002



G. CONCLUSION

The overall performance of the electricity supply services in Malaysia for the year 2002 had improved in comparison with the year 2001.

New generation capacities had been planted up to meet the increasing demand in the next few years.

The prices of electricity in Malaysia are currently competitive in this region.

However, power quality is still a concern of the industrial sector. Utilities and customers should work together to find suitable solutions which are technically and financially acceptable to both parties.

APPENDIX I

REPORT ON THE PERFORMANCE OF CUSTOMER SERVICES OF TNB FOR FINANCIAL YEARS 1996/97 TO 2001/2002

Details	Performance in 1996/97	Performance in 1997/98	Performance in 1998/99	Performance in 1999/00	Performance in 2000/01	Performance in 2001/02
1. CONNECTION OF ELECTRICITY SUPPLY						
A. CHANGE OF CONSUMERS						
No. of applications	76,139	99,489	109,485	114,309	119,724	124,302
Percentage connected within 2 working days	93.5%	84.4%	86%	93.5%	99%	100%
B. NEW SUPPLY (LOW VOLTAGE)						
i. Individual Applications Under Normal Conditions						
No. of applications	127,639	164,610	177,983	168,827	201,894	217,289
Percentage connected within 2 working days	78.3%	83.2%	84%	95%	99%	100%
ii. Individual Applications Under Abnormal Conditions						
No. of applications	6,822	17,197	7,263	2,348	2,007	4,795
Percentage connected within 2 weeks	75.8%	64.8%	73%	92%	99%	100%
iii. Bulk Application And Housing Schemes						
No. of applications	116,932	132,758	146,120	108,903	95,737	145,915
Percentage connected within 1 month	87.2%	87.2%	89%	93%	97%	100%
2. SUPPLY RESTORATION AFTER BREAKDOWNS						
i. Reports						
No. of consumer who have reported	1,119,893	2,352,827	1,895,558	1,479,752	1,666,775	1,243,326
Percentage of such consumers being given report numbers	53.1%	52.7%	53%	67%	90%	94%

Details	Performance in 1996/97	Performance in 1997/98	Performance in 1998/99	Performance in 1999/00	Performance in 2000/01	Performance in 2001/02
ii. Minor breakdowns						
No. of minor breakdowns	93,886	146,828	82,796	63,925	66,818	67,405
Percentage of breakdown rectified within 4 hours	88.7%	83.1%	85%	95%	97%	93%
iii. Major/Extra ordinary breakdowns						
No. of major breakdowns	14,963	16,253	60,430	28,001	7,963	7,138
Percentage of restoration within 2 working days	90.5%	90.4%	84%	93%	91%	95%
3. SUPPLY RECONNECTION AFTER DISCONNECTION						
No. of supply disconnections	578,414	922,869	1,002,946	1,009,243	998,659	990,354
No. of consumers paying bills before 1:00 p.m. on disconnection day	342,429	512,158	588,943	598,705	590,141	589,734
Percentage of supply reconnection on the same day for those who paid the bills before 1:00 p.m.	91.5%	93.6%	93%	98%	99%	99%
4. SUPPLY INTERRUPTIONS WHICH WERE PLANNED / SCHEDULED						
No. of scheduled interruptions	14,960	18,418	13,122	11,634	15,774	8,969
Percentage of consumer given 24 hours notice	79.2%	82.2%	69%	77%	92%	96%
Percentage not given notice	13.5%	9.9%	6.8%	4%	1%	2%

Details	Performance in 1996/97	Performance in 1997/98	Performance in 1998/99	Performance in 1999/00	Performance in 2000/01	Performance in 2001/02
5. METER READING						
No. of consumers with estimated readings exceeding 3 consecutive months	851,406	937,738	754,529	515,062	407,390	420,870
Percentage of customers with estimated readings exceeding 3 consecutive months been given notice	44.0%	44.8%	52%	89%	97%	96%
6. ENQUIRIES / WRITTEN COMPLAINTS FROM CONSUMERS						
i. Written enquiries including questions regarding accounts/bills						
No. of written complaints received	3,737	6,696	8,116	5,057	5,799	4,659
Percentage being replied within 7 working days	95.9%	75.9%	86%	93%	99%	100%
7. COMPLAINTS THROUGH TELEPHONE						
No. of complaints through telephone which could not be settled at the same moment.	6,425	26,935	36,126	20,861	26,314	37,735
Percentage of such complaints who were recontacted within 24 hours	82.7%	66.8%	64%	84%	98%	100%
8. APPOINTMENT FOR METER ACCURACY CHECK						
No. of appointments for meter accuracy check	22,711	27,061	17,965	16,454	14,183	10,099
Percentage of meter accuracy check carried out within 2 working days.	95.9%	95.7%	85%	93%	98%	99%

Details	Performance in 1996/97	Performance in 1997/98	Performance in 1998/99	Performance in 1999/00	Performance in 2000/01	Performance in 2001/02
9. METER REPLACEMENT						
No. of meters replaced	184,205	171,023	324,487	403,654	257,245	179,413
Percentage of meter replacement within 2 working days	78.6%	82.2%	85%	94%	98%	100%
10. APPOINTMENT WITH CONSUMERS						
i. For appointments outside TNB premises						
Appointments where TNB officers arrived not later than 30 minutes from the agreed time.	92.8%	85.6%	77%	92%	96%	100%
ii. Postponement by TNB						
Percentage of subsequent appointment made within 2 working days	80.0%	30.8%	22%	83%	96%	100%
11. DEPOSITS						
No. of consumers who were found after 6 months that their deposits exceeded average consumption of 2 months	1,672,800	1,652,568	1,787,972	881,863	42,513	30,476
Percentage of such consumers who had the excess deposits returned.	0.1%	0.2%	56%	84%	96%	100%
12. REFUND OF CONSUMER DEPOSITS						
No. of consumers who forwarded all required documents for refund of deposits	51,313	72,876	80,277	80,086	86,041	82,097
Consumers who had their deposits refunded within 2 months.	71.3%	74.6%	83%	94%	99%	99%

Details	Performance in 1996/97	Performance in 1997/98	Performance in 1998/99	Performance in 1999/00	Performance in 2000/01	Performance in 2001/02
13. COLLECTION						
Percentage of consumers who paid through the post and proof of payment been send within 7 working days.	68.0%	65.6%	61%	96%	100%	100%
14. SUPPLY DISCONNECTION						
i. With 24 hours notice	3,044	8,978	14,017	17,991	6,726	12,045
No. of disconnections due to dangerous consumer installations	2,233	5,885	7,197	17,158	5,696	11,544
No. of disconnections due to suspicion of theft of electricity	509	399	853	136	989	35
No. of disconnections due to electricity meter being damaged	302	2,694	5,967	697	41	466
ii. Without any notice	344,321	482,879	466,789	347,659	335,277	378,933
No. of disconnections due to failure to pay the bills within 15 days after issuance of bill	335,125	471,764	444,017	346,996	329,762	364,269
No. of disconnections due to failure to pay additional deposits within 7 days from the date of notice.	7,906	9,650	22,644	657	5,098	12,422
No. of disconnections of installations which were dangerous.	1,290	1,465	128	6	417	2,242
15. SPECIAL CONSUMERS WHO FACE PROBLEMS IN PAYING ELECTRIC BILLS	2,305	792	1,445	410	501	436
No. of handicapped consumers who appealed to avoid disconnection.	954	68	963	31	55	48
No. of senior consumers who appealed to avoid disconnection.	125	236	167	64	79	64
No. of handicapped consumers who were assisted in payment of bills.	1,079	204	129	91	141	150
No. of senior consumers who were assisted in payment of bills.	147	284	186	224	226	174

APPENDIX II

REPORT ON THE PERFORMANCE OF CUSTOMER SERVICES OF SESB FOR FINANCIAL YEARS 1998/99 TO 2001/2002

Details	Performance in 1998/1999	Performance in 1999/2000	Performance in 2000/2001	Performance in 2001/2002
1. CONNECTION OF ELECTRICITY SUPPLY				
A. CHANGE OF CONSUMERS				
No. of applications	1,205	2,332	4,388	6,240
Percentage connected within 2 working days	55.0%	75.0%	97.8%	91.3%
B. NEW SUPPLY (LOW VOLTAGE)				
i. Individual Applications Under Normal Conditions				
No. of applications	5,833	5,162	6,543	8,461
Percentage connected within 4 working days	72.0%	62.0%	84.1%	94.7%
ii. Individual Applications Under Abnormal Conditions				
No. of applications	85	75	39	35
Percentage connected within 2 weeks	88.0%	85.3%	64.1%	85.7%
iii. Bulk Application And Housing Schemes				
No. of applications	99	763	156	2,437
Percentage connected within 1 month	87.0%	90.0%	85.9%	99.9%

Details	Performance in 1998/1999	Performance in 1999/2000	Performance in 2000/2001	Performance in 2001/2002
2. SUPPLY RESTORATION AFTER BREAKDOWNS				
i. Reports				
No. of consumer who have reported	5,655	10,686	38,305	58,263
Percentage of such consumers being given report numbers	50.0%	53.2%	94.7%	99.7%
ii. Minor breakdowns				
No. of minor breakdowns	4,780	4,189	8,139	6,341
Percentage of breakdown rectified within 6 hours	96.0%	97.4%	85.1%	92.8%
iii. Major/Extra ordinary breakdowns				
No. of major breakdowns	1,078	1,208	2,597	2,051
Percentage of restoration within 4 days	100%	100%	100%	100%
3. SUPPLY RECONNECTION AFTER DISCONNECTION				
No. of supply disconnections	20,329	17,687	25,840	47,673
No. of consumers paying bills before 1:00 p.m. on disconnection day	11,968	8,025	9,360	25,379
Percentage of supply reconnection on the same day for those who paid the bills before 1:00 p.m.	90.9%	97.9%	96.0%	98.8%
4. SUPPLY INTERRUPTIONS WHICH WERE PLANNED / SCHEDULED				
No. of scheduled interruptions	649	450	521	449
Percentage of consumer given 24 hours notice	82.3%	98.0%	89.8%	93.6%

Details	Performance in 1998/1999	Performance in 1999/2000	Performance in 2000/2001	Performance in 2001/2002
5. METER READING				
No. of consumers with estimated readings exceeding 3 consecutive months	Not Available	13,541	4,194	11,614
Percentage of customers with estimated readings exceeding 3 consecutive months been given notice	Not Available	5.4%	21.7%	26.2%
6. ENQUIRIES / WRITTEN COMPLAINTS FROM CONSUMERS				
i. Written enquiries including questions regarding accounts/bills				
No. of written complaints received	38	131	416	148
Percentage being replied within 7 working days	Not Available	17.0%	98.8%	91.9%
7. COMPLAINTS THROUGH TELEPHONE				
No. of complaints through telephone which could not be settled at the same moment.	289	98	190	304
Percentage of such complaints who were recontacted within 24 hours	92.7%	94.0%	93.2%	96.1%
8. APPOINTMENT FOR METER ACCURACY CHECK				
No. of appointments for meter accuracy check	289	268	461	693
Percentage of meter accuracy check carried out within 7 working days.	83.0%	82.5%	90.2%	95.4%

Details	Performance in 1998/1999	Performance in 1999/2000	Performance in 2000/2001	Performance in 2001/2002
9. METER REPLACEMENT				
No. of meters replaced	Not Available	1,759	3,115	2,246
Percentage of meter replacement within 2 weeks	(62.8%)	76.5%	83.1%	87.2%
10. APPOINTMENT WITH CONSUMERS				
i. For appointments outside TNB premises				
Appointments where TNB officers arrived not later than the agreed time.	90.0%	90.4%	94.2%	93.6%
ii. Postponement by TNB				
Percentage of subsequent appointment made within 2 working days	77.8%	95.0%	90.3%	100%
11. DEPOSITS				
No. of consumers who were found after 6 months that their deposits exceeded average consumption of 2 months	287	293	15	9
Percentage of such consumers who had the excess deposits returned.	100%	100%	100%	100%
12. REFUND OF CONSUMER DEPOSITS				
No. of consumers who forwarded all required documents for refund of deposits	1,520	1,855	2,173	4,630
Consumers who had their deposits refunded within 2 months.	93.3%	92.0%	86.4%	86.7%

Details	Performance in 1998/1999	Performance in 1999/2000	Performance in 2000/2001	Performance in 2001/2002
13. COLLECTION				
Percentage of consumers who paid through the post and proof of payment been send within 7 working days.	23.4%	49.8%	46.8%	59.9%
14. SUPPLY DISCONNECTION				
i. With 24 hours notice				
No. of disconnections due to dangerous consumer installations	1,567	1,569	28,135	25,766
No. of disconnections due to suspicion of theft of electricity	3,197	3,209	518	529
No. of disconnections due to electricity meter being damaged	38	30	93	8
ii. Without any notice				
No. of disconnections due to failure to pay the bills within 15 days after issuance of bill	2,699	9,894	4,669	29,373
No. of disconnections due to failure to pay additional deposits within 7 days from the date of notice	Not Available	Not Available	3	1
No. of disconnections of installations which were dangerous	97	97	2	0

Details	Performance in 1998/1999	Performance in 1999/2000	Performance in 2000/2001	Performance in 2001/2002
15. SPECIAL CONSUMERS WHO FACE PROBLEMS IN PAYING ELECTRIC BILLS				
No. of handicapped consumers who appealed to avoid disconnection.	2	Not Available	7	34
No. of senior consumers who appealed to avoid disconnection	8	Not Available	35	53
No. of handicapped consumers who were assisted in payment of bills.	0	Not Available	8	42
No. of senior consumers who were assisted in payment of bills.	1	Not Available	34	39