

# INDUSTRI PEMBEKALAN ELEKTRIK DI MALAYSIA

*Electricity Supply Industry in Malaysia*

**MAKLUMAT PRESTASI DAN STATISTIK**

*Performance and Statistical Information*

# 2012



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**SURUHANJAYA TENAGA (ENERGY COMMISSION)**

No. 12, Jalan Tun Hussein, Precinct 2, 62100 Putrajaya, Malaysia

Tel | Tel: (03)8870 8500 Faks | Fax: (03)8888 8637

Bebas Tol | Tol Free: 1-800-2222-78 (ST)

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Segala data dan maklumat yang terkandung di dalam buku laporan ini memberi gambaran yang munasabah dan saksama bagi keseluruhan industri pembekalan elektrik di negara ini. Segala usaha telah diambil untuk memastikan semua maklumat yang terkandung di dalam laporan ini telah disahkan kesahihannya berdasarkan laporan harian, bulanan dan tahunan yang dihantar oleh pemegang-pemegang lesen sebagaimana termaktub di bawah syarat-syarat lesen. Manakala bagi negeri Sarawak, maklumat mengenai statistik dan prestasi utiliti di negeri tersebut dikemukakan oleh Sarawak Energy Berhad (SEB) mengikut permintaan Suruhanjaya Tenaga (ST).

ST dengan niat yang baik menerbitkan maklumat ini untuk kegunaan orang awam, sejajar dengan fungsi yang ditetapkan di bawah Akta. ST menafikan semua atau apa-apa jua tanggungjawab kepada sesiapa sahaja untuk maklumat yang terkandung di dalam laporan ini atau bagi apa-apa representasi atau kenyataan di sini, sama ada secara tersurat atau tersirat, atau untuk apa-apa jawapan yang diberikan sebagai maklumbalas kepada sebarang pertanyaan berhubung dengan laporan ini.

*The data and information in this report represent a fair and reasonable overview of the whole electricity supply industry. Every effort has been made to verify, validate and accurately represents the information in this report, based on the daily, monthly and yearly reports which were submitted by licensees pursuant to their licence conditions. As for Sarawak, information on the performance and statistics of utility in the state were submitted by Sarawak Energy Berhad (SEB) based on request by the Energy Commission (EC).*

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## RINGKASAN EKSEKUTIF

### EXECUTIVE SUMMARY

#### Prestasi Sistem Pembekalan Elektrik di Semenanjung Malaysia

##### Sistem Penjanaaan

Pada tahun 2012, purata kecekapan thermal bagi stesen-stesen jana kuasa kitar padu, kitar terbuka dan arang batu milik Penjana-Penjana Bebas (IPPs) di Semenanjung Malaysia merosot sedikit berbanding tahun sebelumnya. Bagi stesen jana kuasa kitar padu dan kitar terbuka milik TNB, purata kecekapan thermalnya meningkat berikutan peningkatan jumlah senggaraan berjadual yang dilaksanakan sepanjang tahun, selain dari purata faktor kapasiti yang tinggi. Ini dibuktikan dengan peningkatan penggunaan gas di stesen jana kuasa berasaskan gas kepada 372, 739 mmscf berbanding 337, 151 mmscf pada tahun 2011. Stesen jana kuasa konvensional (minyak/gas) milik TNB pula menunjukkan prestasi yang lebih rendah disebabkan usia fasiliti yang telah lanjut usia dan degradasi loji jana kuasa tersebut.

Bagi Faktor Kesediaan Setara (EAF), stesen jana kuasa kitar padu telah pun mencatatkan pencapaian yang baik sekitar 94% hingga 95%. Stesen jana kuasa arang batu pula mencatatkan bacaan EAF terendah iaitu sekitar 84%. Peningkatan EAF secara keseluruhan ini turut mempengaruhi kadar bagi Faktor Henti Tugas Tidak Berjadual Setara (EUOF). Bekalan gas yang lebih terancang dan baik membolehkan stesen-stesen jana kuasa menjalankan aktiviti senggaraan dengan lebih teratur seterusnya mempertingkatkan daya harap sesebuah stesen jana kuasa dan mengurangkan peratusan EUOF.

##### Sistem Penghantaran

Tahun 2012 melaporkan 4 insiden pelantikan dengan kehilangan beban 50 MW ke atas, lebih baik berbanding tahun sebelumnya sebanyak 5 insiden pelantikan. Kejadian insiden yang direkodkan berlaku pada 1 Mac 2013 di pencawang 275/132/33/11 kV di Universiti Kebangsaan Malaysia (UKM), 6 Mac pada talian atas 132 kV Alor Setar ke Kota Setar L1 & L2, 28 April pada Busbar Rizab 132 kV Pasir Gudang Power Station, dan 24 Mei pada talian atas North-Damansara. Namun begitu, tiada insiden lucutan beban dilaporkan manakala jumlah tenaga yang tidak dibekalkan juga berkurang kepada 212.7 MWj berbanding 225.2 MWj pada tahun 2011. *Delivery Point Index* (DePUI) pula meningkat sedikit kepada 1.03 minit berbanding 1.01 minit pada tahun 2011.

#### Performance of Electricity Supply System in Peninsular Malaysia

##### Generation System

In 2012, the average thermal efficiency for combined cycle, open cycle and coal powered plants of Independent Power Producers (IPPs) in Peninsular Malaysia had slightly declined compared to that in the previous year. Meanwhile, the performance in the average thermal efficiency for TNB owned combined and open cycle power plants improved especially in gas combined cycle power plants due to frequent scheduled maintenance performed throughout the year, besides the high average capacity factor. This is proven as the gas consumption in gas-based power plants had increased to 372, 739 mmscf from 337, 151 mmscf in 2011. However, TNB's conventional (oil/gas) power plants showed a lower performance due to the aging facilities and degradation.

For the Equivalent Availability Factor (EAF), the combined cycle power plants achieved excellent performances and recorded a high EAF around 94 percent to 95 percent. However, coal-fired power plants recorded low EAF around 84 percent. The increase in the overall EAF affected the rate of Equivalent Unplanned Outage Factor (EUOF). In other words, with the certainty and planned supply of gas, it enables the power plants to run orderly maintenance activities thus improving the reliability of the power stations, thus reducing the percentage of EUOF.

##### Transmission System

Year 2012 recorded 4 tripping incidents with load loss of above 50 MW, an improvement compared to the previous year with 5 tripping incidents. The recorded incidents happened on March 1, 2013 at 275/132/33/11 kV substation at Universiti Kebangsaan Malaysia (UKM), March 6 at the 132 kV line from Kota Setar Alor Setar to L1 & L2, April 28 at the Reserve Busbar at 132 kV Pasir Gudang Power Station, and May 24 at the North-Damansara line. However, there were no reported case of load shedding and the amount of unsupplied energy had also declined to 212.7 MWh from 225.2 MWh in 2011. *Delivery Point Index* (DePUI) has increased slightly to 1.03 minutes from 1.01 minutes the previous year.

## Sistem Pengagihan

Indeks SAIDI telah berkurangan sebanyak 12.5 peratus dari 69.11 minit/pelanggan/tahun pada tahun 2011 kepada 60.46 minit/pelanggan/tahun pada tahun 2012. Penurunan ini menunjukkan prestasi perkhidmatan sistem pengagihan TNB telah bertambah baik dan menepati sasaran yang ditetapkan sebanyak 70 minit/pelanggan/tahun.

Seperti tahun-tahun sebelumnya, gangguan voltan sederhana merupakan penyumbang utama indeks SAIDI. Ke arah usaha yang berterusan bagi mengurangkan indeks SAIDI ini, TNB telah melaksanakan beberapa pelan tindak. Antara yang dijalankan termasuklah pelan tindak bagi sistem voltan rendah seperti:

- memperketatkan semakan semasa penyerahan projek baru
- memberi kursus ulangan kepada supervisor dan kontraktor, dan
- penilaian amalan kejuruteraan

Manakala bagi sistem voltan sederhana yang menyumbang lebih daripada 90 peratus indeks SAIDI ini, fokus diberikan kepada sistem kabel bawah tanah, sambungan kabel, kerosakan oleh *third party* dan penamatan kabel. Antara tindakan jangka pendek telah dilaksanakan termasuklah:

- ujian penebatan kabel
- ujian *partial discharge* kabel bawah tanah
- menggantikan kabel *Paper Insulated Lead Cover (PILC)*, dan
- menggantikan tamatan lama kepada yang baru

Pelan tindakan jangka panjang juga telah dilaksanakan seperti menaik taraf saiz kabel, menukar kabel voltan sederhana yang banyak penyambungan, menukar kabel PILC kepada kabel XLPE dan lain-lain.

Sementara itu, di Kulim Hi-Tech Park (KHTP) pula, SAIDI dilaporkan telah meningkat dengan mendadak dari 7.88 minit/pelanggan/tahun kepada 33.23 minit/pelanggan/tahun. Perkara ini disebabkan berlakunya 2 kerosakan dalam bulan April 2012 dan 1 kerosakan dalam bulan September 2012 pada kabel 11 kV yang melibatkan ramai pengguna. Namun begitu, tiada pengguna yang dilaporkan terlibat di dalam insiden voltan tinggi di KHTP dalam tahun 2012.

## Kualiti Kuasa

Merujuk kepada *IEEE 1159*, kualiti kuasa diukur berdasarkan insiden junaman voltan yang berlaku dalam jangka masa 10 milisaat sehingga 60 saat. Ia juga dikenali sebagai *undervoltage*

## Distribution System

*SAIDI has decreased by 12.5 percent from 69.11 minutes/customer/year in 2011 to 60.46 minutes/customer/year in 2012. The drop in SAIDI showed that TNB distribution system service has improved and achieved the given target set at 70 minutes/customer/ year.*

*As in previous years, the main contributor to the index for SAIDI was the medium voltage interruptions. In its continual efforts to reduce the index for SAIDI, TNB had put several action plans in place. The action plan, among others is for low voltage interruptions Several efforts were taken for low voltage interruptions such as:*

- *stringent checks upon submission of new projects*
- *conducting courses for supervisors and contractors involved, and*
- *hand-holding.*

*Meanwhile, for Medium Voltage System interruptions that contributes more than 90 percent of the index for SAIDI, primary focus were put on the underground cables system, cables' joint, damages caused by third party and cable termination. Several short-term plans had been conducted such as:*

- *cable insulation test*
- *partial discharge test for underground cables*
- *replacing the Paper Insulated Lead Cable (PILC) cables, and*
- *replacing the old joints with new ones.*

*Long-term action plans had also been implemented by upgrading the cable sizes, replacing the medium voltage cables with many joints, replacing PILC cable with XLPE cables and others.*

*In Kulim Hi- Tech Park (KHTP), SAIDI marked a sharp increase from 7.88 minutes/customer/year in 2011 to 33.23 minutes/customer/year in 2012. This is due to two major faults in April 2012 and 1 major fault in September, all at 11 kV cables involving many users. However, there were no customers involved in any high-voltage incidents in KHTP in 2012*

## Power Quality

*With reference to IEEE 1159, power quality is measured by the number of voltage dips that occurs within 10 milliseconds to 60 seconds. Voltage dip is also known as undervoltage and*

dan diukur menggunakan System Average RMS Index (SARFI). Pemantauan SARFI ini dilakukan dengan memasang 150 unit alat perakam kualiti kuasa di pencawang masuk utama (PMU) di mana aduan pengguna berkenaan kejadian junaman voltan dirakamkan di 150 PMU tersebut. Pada tahun 2012, sistem 33kV telah mencatatkan nilai SARFI<sub>90</sub> yang tertinggi iaitu 6.8. Bilangan aduan kualiti kuasa berkenaan junaman voltan pula telah meningkat kepada 103 aduan berbanding 93 aduan pada tahun 2011. Antara punca utama berlakunya kes junaman voltan termasuklah kejadian-kejadian seperti gangguan ubah-tika, kilat dan kerosakan kabel yang menyumbang sebanyak 72 peratus dari keseluruhan punca yang direkodkan. Bagi menangani masalah berkenaan kualiti kuasa terutamanya di kawasan perindustrian ini, pihak TNB telah menawarkan perkhidmatan rundingan dengan para pengguna. Bagi melaksanakan proses ini, TNB Bahagian Pembahagian telah melantik pihak TNB Engineering Services Sdn. Bhd. (TNBES) untuk bertanggungjawab memberikan maklumbalas punca seterusnya memberikan tindakan susulan.

Di KHTP pula, bilangan insiden junaman voltan telah meningkat sebanyak 17.6 peratus daripada 17 insiden pada tahun 2011 kepada 20 insiden tahun 2012. Dari jumlah keseluruhan, 18 kejadian dilaporkan berpunca dari sistem pembekalan TNB manakala 2 insiden berpunca dari sistem pengagihan NUR. Bilangan pengguna yang terlibat juga meningkat dengan ketara dari 9 pengguna pada tahun 2011 kepada 54 pengguna pada tahun 2012. Penyumbang utama peningkatan ini adalah disebabkan 2 kejadian pelantikan di talian 275kV dari Junjong ke Bukit Tengah dan talian 132 kV dari Kuala Ketil ke Guthrie.

## Prestasi Sistem Pembekalan Elektrik di Sabah

### Sistem Penjanaan

Stesen jana kuasa di Sabah secara keseluruhannya menunjukkan peningkatan purata kecekapan thermal yang konsisten sepanjang tahun 2012. Stesen jana kuasa disel milik SESB menunjukkan sedikit penurunan pada tahun 2012 berbanding tahun 2011. Namun begitu, stesen jana kuasa gas milik SESB pula menunjukkan peningkatan berikutan pengoperasian penuh stesen jana kuasa tersebut bagi memenuhi keperluan kapasiti penjanaan di Sabah.

EAF bagi stesen jana kuasa di Sabah pula didapati merosot pada purata 2 peratus hingga 11 peratus pada tahun 2012. Ini berikutan kekerapan henti tugas stesen jana kuasa disebabkan kerosakan di luar jangkaan, kesukaran mendapatkan alat gantinya, kenaikan kos operasi dan sebagainya. Antara faktor lain menyumbang pada penurunan peratusan EAF ini adalah seperti masalah teknikal yang dialami oleh stesen jana kuasa

measured by System Average RMS (SARFI). They are monitored by power quality recorders installed at PMUs whereby complaints made by the customers are recorded at these 150 PMUs. For the overall system, SARFI<sub>90</sub> has the highest average figure recorded at 6.8. Meanwhile, the number of complaints due to voltage dips had increased to 103 complaints in 2012 compared to only 93 complaints in 2011. The main reasons for voltage dips cases are transient, lightning and damaged cables and these have contributed about 72 percent out of the total number voltage dips cases. To overcome the problems in power quality, especially in industrial areas, TNB has come out with several measures such as by providing consultancy services to the customers. To carry out this responsibility, TNB Distribution Division has appointed TNB Energy Services Sdn.Bhd. (TNBES) to respond to any inquiry related to power quality raised by customers and to provide follow-up consultation services.

In KHTP, the number of voltage dip incidents had increased by 17.6 percent from 17 incidents in 2011 to 20 incidents in 2012. Out of the total, 18 incidents were reported due to the TNB supply system and the remaining stemming from the NUR distribution system. The number of affected users had significantly increased from only 9 users in 2011 to 54 users in 2012 due to two major tripping incidents at talian 275 kV from Junjong to Bukit Tengah and talian 132 kV from Kuala Ketil to Guthrie.

## Performance of Electricity Supply System in Sabah

### Generation System

Overall, the average thermal efficiency for all power plants in Sabah showed a consistent improvement throughout 2012. Despite an overall improvement in thermal efficiency, diesel power plants showed a slight decline in performance compared to the previous year. The improvement is actually contributed by gas based power plants owned by SESB as it is operated at full capacity due to the shortage of electricity supply capacity in Sabah.

EAF for all power stations in Sabah were found to have declined by an average of 2 percent to 11 percent in 2012. The reasons behind the declining EAF in Sabah are the unexpected problems which occurred at the power stations, difficulties to obtain relay devices and an increasing operating cost. Among other factors contributing to low EAF are technical problems at Tenom Pangi power station requiring unit 1 to stop its

Tenom Pangi di mana unit 1 ditutup sepanjang bulan Jun hingga Ogos serta penutupan stesen jana kuasa milik Sandakan Power Corporation Sdn. Bhd. (SPC).

EUOF bagi stesen jana kuasa SESB pula didapati bertambah baik berbanding tahun 2011 apabila stesen jana kuasa kitar padu dan disel beroperasi dalam keadaan baik. Di stesen jana kuasa disel, EUOF telah menurun daripada 30.8 peratus pada tahun 2011 kepada 20.8 peratus pada tahun 2012. Manakala stesen jana kuasa kitar padu pula, EUOF telah menurun daripada 11.5 peratus pada tahun 2011 kepada 6.6 peratus pada tahun 2012.

### Sistem Penghantaran

Bacaan bagi *Delivery Point Index (DePUI)* di Sabah menunjukkan kemerosotan dengan pertambahan sistem minit kepada 67.12 minit daripada 40.13 minit tahun sebelumnya. Perkara ini disumbangkan oleh 5 kejadian pelantikan dengan kehilangan beban 50 MW ke atas yang berlaku pada sistem grid di Sabah. Namun begitu, bacaan ini tidak mengambil kira insiden besar lucutan beban yang berlaku pada 30 April yang menyebabkan kehilangan beban sebanyak 475 MW yang berlaku pada alatubah bagi talian 66kV Penampang-Inanam di PMU Penampang serta 1 insiden voltan berlebihan pada 1 Mei dengan kehilangan beban sebanyak 89.56 MW.

### Sistem Pengagihan

Keseluruhannya, SAIDI di Sabah telah bertambah sebanyak 12.5 peratus daripada 495 minit/pelanggan/tahun pada tahun 2011 kepada 557 minit/pelanggan/tahun pada tahun 2012. Pertambahan SAIDI ini disumbang oleh beberapa isu kritikal yang telah menjejaskan sistem bekalan elektrik di Sabah seperti kerosakan yang di beberapa stesen jana kuasa dan sistem grid talian penghantaran negeri Sabah.

### Kos Bahan Api

Pada tahun 2012, harga minyak mentah berdasarkan Brent Spot berada di atas paras USD 100 setong dengan harga tertinggi dicapai pada bulan Mac 2012, pada harga USD 125 setong. Namun begitu, harga arang batu yang ditunjukkan oleh indeks Newcastle (Freight on Board (FOB)) dan indeks Richard Bay (FOB) menurun di bawah paras USD 100 iaitu di dalam lingkungan USD 85 hingga USD 98 per tan. Penurunan ini disebabkan faktor-faktor seperti penurunan kadar tukaran wang asing USD, penurunan kadar bunker serta ekor dari kadar bekalan yang tinggi berbanding permintaan.

*operation from June to August 2012 and the end of operation of power stations owned by Sandakan Power Corporation Sdn. Bhd. (SPC).*

*EUOF for SESB's power plants were found to have an improvement and showed a better performance compared to its performance in 2011 due to the good condition of these combined cycle and diesel power plants. EUOF for diesel power plants had decreased from 30.8 percent in 2011 to 20.8 percent in 2012. Meanwhile, the EUOF for combined cycle power plant had declined from 11.5 percent in 2011 to 6.6 percent in 2012.*

### Transmission System

*Delivery Point Index (DePUI) in Sabah showed a decline in performance as the system minutes increased to 67.1 minutes from 40.13 minutes in the previous year. This situation was contributed by 5 tripping incidents cases with load loss of above 50 MW that occurred at Sabah grid system. However, this record does not take into account major incidents with load loss of 475 MW at 66 kV transformer line Penampang – Inanam at Penampang's PMU that happened on April 30 and another overvoltage incident with load loss of 89.56 MW.*

### Distribution System

*Overall, SAIDI for Sabah had increased by 12.5 percent from 495 minutes/customer/year in 2011 to 557 minutes/customer/year in 2012. Increase in SAIDI were caused by critical issues that affected the electricity supply system in Sabah such as faults in several power plants and transmission lines of the grid system in Sabah.*

### Fuel Costs

*In 2012, the market price for crude oil based on Brent Spot Price of crude oil stood above USD 100 per barrel with the highest price recorded in March 2012, at USD 125 per barrel. However, the price of coal indicated by the Newcastle index (Freight on Board (FOB)) and the Richard Bay index (FOB) fell below USD 100 to be within USD 85 to USD 98 per tonne. The reduction in coal price is attributed by several factors such as the decline in USD exchange and bunker rates, as well as due to supply of coal that exceeded the demand.*



Bagi harga gas yang ditetapkan oleh kerajaan kepada sektor penjanaan elektrik pula, ia masih kekal seperti di tahun sebelumnya iaitu pada RM 13.70/mmBtu. Penetapan ini dibuat bagi mengekalkan tarif elektrik purata pada 33.54 sen/kWj. Sehingga November 2012, kerajaan telah memperuntukkan diskaun harga gas sebanyak 72 peratus daripada harga gas (formula) kepada sektor penjanaan elektrik

*As for gas prices to the power sector set by the Government, it remains as in the previous year at RM 13.70/ mmBtu. The price remains in order to maintain the average electricity tariff at 33.54 sen/kWh. As of November 2012, the government has allocated a gas price discount of 72 percent from the gas price (formula) for electricity generation sector.*

## Mekanisme Pengebilan Gas

Sejak tahun 2011, satu jawatankuasa pengebilan gas yang dianggotai oleh PETRONAS, Unit Perancang Ekonomi, Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA) dan TNB telah diwujudkan bagi menangani isu *unintended gains* oleh pihak IPP. Jawatankuasa ini dipengerusikan oleh ST yang bertanggungjawab menyelia proses penjimatan wang serta memperakukan jumlah penjimatan tersebut kepada Dana Kumpulan Wang Disatukan. Pada tahun 2012, pelaksanaan mekanisme ini diteruskan serta berjaya merekodkan penjimatan TNB sebanyak RM 63.3 juta sepanjang Mac 2011 hingga Oktober 2012. Penjimatan dari hasil pengurangan pembayaran bahan api oleh TNB kepada pihak IPP seterusnya telah disalurkan kepada Dana Kumpulan Wang Disatukan di KeTTHA.

## Gas Billing Mechanism

*Since 2011, a gas billing committee was established with members consisting of PETRONAS, Economic Planning Unit, Ministry of Energy, Green Technology and Water (KeTTHA) and TNB. The objective is to address the issue of unintended gains by the IPPs. This committee was chaired by the Energy Commission that holds the responsibility to oversee the cost saving process and certifying the amount of savings to the Consolidated Fund. In 2012, the implementation of this mechanism continued and has successfully recorded TNB's savings amounted to RM 63.3 million between March 2011 until October 2012. The savings gained from the reduced energy payment paid by TNB to IPPs were then channeled to the Consolidated Fund in KeTTHA.*

## Situasi Pembekalan dan Permintaan Elektrik di Semenanjung Malaysia

Kehendak maksimum sistem grid di Semenanjung Malaysia telah meningkat sebanyak 2.3 peratus daripada 15,476 MW pada tahun 2011 kepada 15,826 MW pada tahun 2012. Rekod ini dicatat pada jam 16:00, 20 Jun 2012 dengan permintaan tenaga pada hari tersebut sebanyak 328.72 GWj. Permintaan tenaga pada hari itu juga merupakan permintaan tenaga harian tertinggi, kenaikan sebanyak 3.2 peratus berbanding tahun sebelumnya. Permintaan tenaga elektrik tahunan pula telah meningkat sebanyak 4.1 peratus dari 104, 220 GWj pada tahun 2011 kepada 108, 473 GWj pada tahun 2012. Jualan tenaga turut meningkat sebanyak 3.8 peratus daripada 93,640 GWj pada tahun 2011 kepada 97,243 GWj pada tahun 2012.

## Electricity Supply and Demand Situation in Peninsular Malaysia

*Maximum demand of the grid system in Peninsular Malaysia had increased by 2.3 percent from 15,476 MW in 2011 to 15, 826 MW in 2012. This reading was recorded at 16:00, 20 June 2012 with the daily demand stood at 328.72 GWh. That is the highest daily demand recorded throughout the year, an increase of 3.2 percent compared to the previous year. The total yearly electricity demand had also increase by 4.1 percent from 104,220 GWh in 2011 to 108,473 GWh in 2012. Meanwhile, the sales of electricity had increased by 3.8 percent from 93, 640 GWh in 2011 to 97, 243 GWh in 2012.*

Kapasiti Penjanaan di Semenanjung Malaysia pula telah berkurang kepada 21,749 MW berikutan perpindahan turbin gas 68 MW di Teluk Ewa, Pulau Langkawi ke Tawau, Sabah. Daripada jumlah keseluruhan tersebut, stesen jana kuasa TNB menyumbang sebanyak 41.7 peratus (9,072 MW), terdiri daripada 1,911 MW stesen jana kuasa hidro, 5,061 MW stesenjana kuasa thermal dan 2,100 MW stesen jana kuasa arang batu. Selainnya, sebanyak 58.3 peratus (12,677 MW) disumbang oleh IPP di Semenanjung Malaysia.

*The generation capacity in Peninsular Malaysia was reduced to 21,749 MW following the transfer of the 68 MW gas turbine in Teluk Ewa, Langkawi to Tawau, Sabah. Out of the total generation capacity, TNB power stations accounted for 41.7 percent (9,072 MW ), consisting of 1,911 MW of hydro power plants, 5,061 MW thermal power plants and 2,100 MW coal -fired power plants. The remaining capacity of 58.3 percent (12,677 MW) were from IPPs in Peninsular Malaysia.*

Bagaimanapun, berdasarkan pengujian tahunan yang dijalankan, *Tested Annual Available Capacity (TAAC)* yang dicatatkan adalah sebanyak 21,609 MW di mana 6,547 MW dibekalkan oleh stesen jana kuasa TNB dan selebihnya oleh stesen jana kuasa IPP di Semenanjung Malaysia. Tahun 2012 mencatatkan rizab margin yang masih selesa dalam lingkungan 37 peratus berbanding 41 peratus pada tahun 2011.

### Situasi Pembekalan dan Permintaan Elektrik di Sabah

Sabah masih lagi berhadapan dengan isu kekurangan bekalan elektrik. Ianya berlanjutan dan semakin meruncing dengan pemberhentian operasi stesen jana kuasa Sandakan Power Corporation (SPC) berkapasiti 32 MW akibat kerosakan teruk pada enjin diselnya, kekerapan henti tugas di luar jangka stesen ARL Power berkapasiti 47.5 MW dan berikutan masalah berkenaan bekalan bahan api yang dihadapi oleh stesen jana kuasa Stratavest. Selain itu, sesetengah stesen jana kuasa SESB juga menghadapi masalah berikutan tahap kesediaan dan daya harapnya yang rendah.

Kehendak maksimum sistem grid di Sabah adalah sebanyak 828.4 MW direkodkan pada 24 Mei 2012, berkurang sebanyak 0.2 peratus berbanding tahun sebelumnya.

Jumlah kapasiti penjanaan terpasang di Sabah pula direkodkan sebanyak 1,265 MW, pengurangan sebanyak 32 MW ekoran pemberhentian stesen jana kuasa SPC. Bagi mengatasi masalah kekurangan bekalan elektrik di Sabah, beberapa langkah telah diambil termasuklah penambahan kapasiti sedia ada stesen jana kuasa serta meningkatkan tahap kesediaan stesen jana kuasa disel milik SESB. Dengan mengambilkira beberapa faktor seperti deration dan kekangan pada sistem penjanaan, kapasiti boleh harap dicatatkan sebanyak 1,130 MW. Dari jumlah keseluruhan ini, 673.5 MW merupakan kapasiti penjanaan IPP, 417.3 MW dari stesen jana kuasa SESB dan 39.5 MW dari stesen jana kuasa tenaga boleh baharu.

Jumlah penjanaan pula sebanyak 5,478 GWh dengan pecahan berikut, 69.6 peratus berasaskan gas, 19.5 peratus berasaskan Medium Fuel Oil (MFO) dan disel, 7.6 peratus dari hidro dan 3.3 peratus dari sumber tenaga boleh baharu.

*However, based on the annual testing performed, the Tested Annual Available Capacity (TAAC) had recorded the total generation capacity of 21,609 MW of which 6,547 MW were supplied by TNB and the remaining were from the IPPs in Peninsular Malaysia. In 2012, the reserve margin remains at a comfortable zone around 37 percent compared to 41 percent in 2011.*

### Electricity Supply and Demand Situation in Sabah

*Sabah is still facing an issue of insufficient supply of electricity. This situation had worsened with the cessation of the Sandakan Power Station Sdn. Bhd. (SPC) with a capacity of 32 MW due to severe damage of its diesel engine, frequent unscheduled outage of ARL Power Station with a capacity of 47.5 MW and due to fuel supply issue faced by Stratavest Power Station. Besides that it also includes problem faced by several SESB's plants due to their low availability and reliability level.*

*The maximum demand in Sabah stood at 828.4 MW recorded at 24 May 2012, a decrease by 0.2 percent compared with the previous year.*

*The total installed generation capacity stood at 1,265 MW, a decrease of 32 MW as a result of the ceased operation of SPC. To overcome the shortage in electricity, several measures had been taken such as by increasing the capacity of existing power plants as well as improving the availability of diesel based power stations owned by SESB. Taking into account of few factors such as deration and constraints of the generation system, the dependable capacity stood at 1,130 MW. Out of the total dependable capacity in Sabah, 673.5 GWh came from the IPPs in Sabah, followed by 417.3 GWh from SESB owned power plants and 39.5 GWh from renewable energy power plants.*

*The total generation in Sabah stood at 5,478 GWh with the share of generation mix as follows: gas at 69.6 percent, MFO and diesel at 19.5 percent, hydro at 7.6 percent and renewable energy sources at 3.3 percent.*

## Situasi Pembekalan dan Permintaan Elektrik di Sarawak

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Sarawak Energy Berhad (SEB) yang dimiliki sepenuhnya oleh Kerajaan Negeri Sarawak beroperasi secara bersepadu serta terlibat dalam aktiviti penjanaan, penghantaran dan pengagihan elektrik di Sarawak. SEB melalui Syarikat SESCO Berhad (SESCO) bertanggungjawab ke atas infrastruktur penghantaran dan pengagihan. Jumlah keseluruhan kapasiti penjanaan pada tahun 2012 yang direkodkan oleh SEB ialah sebanyak 1,352 MW. Ini termasuklah jumlah kapasiti bagi stesen-stesen jana kuasa SESCO (555 MW), Sejingkat Power Corporation Sdn Bhd (SPC) (100 MW), PPLS Power Generation Sdn Bhd (PPLS) (110 MW), Sarawak Power Generation Sdn Bhd (SPG) (317 MW) dan Mukah Power Generation Sdn Bhd (MPG) (270 MW). Pada masa yang sama, 4 unit di Bakun telah pun beroperasi berbanding hanya 3 unit pada tahun sebelumnya, menyumbangkan kapasiti penjanaan tambahan sebanyak 1,200 MW di Sarawak.

Di Sarawak, kehendak maksimum telah berkurangan sebanyak 3.9 peratus dari 1,278 MW pada tahun 2011 kepada 1,228 MW pada tahun 2012. Namun begitu, jumlah pelanggan telah bertambah seramai 20,502 orang pelanggan baru menjadikan jumlah keseluruhan pelanggan SEB sebanyak 549,053. Jumlah tenaga turut meningkat sebanyak 17 peratus berbanding tahun sebelumnya, menjadikan jumlah jualan tenaga pada tahun 2012 sebanyak 7,587 GWh bersamaan dengan nilai sebanyak RM 1,862 juta.

## Electricity Supply and Demand Situation in Sarawak

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*Sarawak Energy Berhad (SEB), wholly owned by the Sarawak State Government is a vertically integrated utility group involved in the generation, transmission, and distribution of electricity in the state of Sarawak. SEB via Syarikat SESCO Berhad (SESCO) controls the state's transmission and distribution infrastructure. In 2012, the total generating capacity of SEB stood at 1,352 MW. The total includes the generating capacity from SESCO at 555 MW, Sejingkat Power Corporation Sdn. Bhd. (SPC) (100 MW), PPLS Power Generation Sdn Bhd (PPLS) (110 MW), Sarawak Power Generation Sdn Bhd (SPG) (317MW) and Mukah Power Generation Sdn Bhd (MPG) (270 MW). Meanwhile, 4 units of Bakun had operated in 2012 compared to only 3 units in the previous year, contributing to an additional generating capacity of 1,200 MW in Sarawak.*

*The maximum demand had reduced by 3.9 percent from 1,278 MW in 2011 to 1,228 MW in 2012. Meanwhile, the number of SEB's customers had increased by 20,502, bringing the total number of SEB's customer to 549,053. The total electricity sales had also increased by 17 percent compared to the previous year, bringing up the total electricity sales in 2012 to 7,587 GWh equivalent to a total value of RM 1,862 million.*

# PROFIL NEGARA, DATA UTAMA EKONOMI DAN TENAGA ELEKTRIK

## COUNTRY PROFILE, KEY ECONOMIC AND ELECTRICITY DATA

### Profil Negara | Country Profile

|                              |   |
|------------------------------|---|
| Keluasan Kawasan   Land Area | : 330,290 km <sup>2</sup>   |
| Iklim   Climate              | : Jenis Tropika   Tropical Type   |
|                              | : Purata Suhu di antara 21° C hingga 32° C<br>Average temperature is between 21° C to 32° C |
|                              | : Purata taburan hujan tahunan 3,540 mm<br>Average annual rainfall is 3,540 mm              |
| Jumlah Penduduk   Population | : 29.3 juta   million   |
| Tenaga Kerja   Labour Force  | : 13.1 juta   million   |

### Data Utama Ekonomi | Key Economic Data

|   |   |
|---|---|
| KDNK pada Harga Semasa   GDP at Current Prices                                  | : RM 941.2 bilion   billion   |
| KDNK pada Harga Malar 2005   GDP at Constant 2005 Prices                        | : RM 751.5 bilion   billion   |
| KDNK pada Harga Semasa per Kapita   GDP at Current Prices per Capita            | : RM 32, 124.10 per Kapita   per Capita                             |
| KDNK pada Harga Malar 2005 per Kapita<br>GDP at Constant 2005 Prices per Capita | : RM 25, 647.50 per Kapita   per Capita                             |
| PNK pada Harga Semasa   GNI at Current Prices                                   | : RM 905.2 bilion   billion   |
| PNK pada Harga Malar 2005   GNI at Constant 2005 Prices                         | : RM 693.1 bilion   billion   |
| PNK pada Harga Semasa per Kapita   GNI at Current Prices per Capita             | : RM 30, 908 per Kapita   per Capita                                |
| PNK pada Harga Malar 2005 per Kapita<br>GNI at Constant 2005 Prices per Capita  | : RM 23, 655 per Kapita   per Capita                                |
| Imbangan Akaun Semasa   Current Account Balance                                 | : RM 57.3 bilion   billion  |
| Simpanan Luar Negara Kasar   Gross International Reserves                       | : RM 427.2 bilion   billion   |
| Tabungan Negara Kasar   Gross National Saving                                   | : 299.9 bilion (33.1% daripada PNK)<br>299.9 billion (33.1% of PNK) |

### Data Utama Elektrik | Key Electricity Data

|   |                           |
|---|---------------------------|
| Jumlah Kapasiti Terpasang   Total Electricity Generation          | : 28, 824 MW   MW         |
| Jumlah Penjanaan Tenaga Elektrik   Total Electricity Generation   | : 134, 077 GWj   GWh      |
| Jumlah Penggunaan Tenaga Elektrik   Total Electricity Consumption | : 115, 118 GWj   GWh      |
| Purata Harga Jualan Elektrik   Electricity Average Selling Price  |                           |
| Semenanjung Malaysia   Peninsular Malaysia                        | : 33.73 sen/kWj   sen/kWh |
| Sabah   | : 29.12 sen/kWj   sen/kWh |
| Sarawak   | : 29.68 sen/kWj   sen/kWh |

Sumber | Source:

Syarikat Utama Utiliti Tenaga Elektrik, Co-Generators, Penjana Persendirian, Bank Negara Malaysia, Jabatan Perangkaan Negara  
Main Electricity Utility Companies, Co-Generators, Self Generators, Central Bank of Malaysia, Department of Statistics



# PETA MALAYSIA MAP OF MALAYSIA



**PRESTASI SISTEM PEMBEKALAN DAN  
PERKHIDMATAN ELEKTRIK**  
*PERFORMANCE OF ELECTRICITY SUPPLY  
SYSTEM AND SERVICES*



# PRESTASI PEMBEKALAN DAN PERKHIDMATAN ELEKTRIK DI SEMENANJUNG MALAYSIA

## PERFORMANCE OF ELECTRICITY SUPPLY AND SERVICES IN PENINSULAR MALAYSIA

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## Sistem Penjanaan TNB dan Penjana-Penjana Kuasa Bebas (IPPs) di Semenanjung Malaysia

### TNB and Independent Power Producers (IPPs) Generation System in Peninsular Malaysia

**Jadual 1: Purata Kecekapan Thermal (%)**

Table 1: Average Thermal Efficiency (%)

| Jenis Loji<br>Plant Type                            | 2008  |       | 2009  |       | 2010  |       | 2011  |       | 2012  |       |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | TNB   | IPP   | TNB   | IPP   | TNB   | IPP   | TNB   | IPP   | TNB   | IPP   |
| Kitar Padu   Combined Cycle                         | 41.20 | 44.80 | 41.00 | 44.30 | 41.20 | 41.90 | 40.84 | 43.98 | 44.34 | 43.96 |
| Kitar Terbuka   Open Cycle                          | 25.60 | 26.10 | 17.40 | 27.40 | 22.60 | 27.30 | 22.30 | 27.09 | 26.29 | 26.77 |
| Konvensional (Minyak/Gas)<br>Conventional (Oil/Gas) | 18.30 | 32.20 | n/a   | 31.90 | 25.60 | 32.30 | 27.27 | 30.58 | 26.6  | 32.34 |
| Konvensional (Arang Batu)<br>Conventional (Coal)    | -     | 33.80 | -     | 34.70 | -     | 33.10 | -     | 35.11 | -     | 35.53 |

**Jadual 2: Purata Faktor Kesediaan Setara (EAF) (%)**

Table 2: Average Equivalent Availability Factor (EAF) (%)

| Jenis Loji<br>Plant Type                            | 2008  |       | 2009  |       | 2010  |       | 2011  |       | 2012  |       |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | TNB   | IPP   | TNB   | IPP   | TNB   | IPP   | TNB   | IPP   | TNB   | IPP   |
| Kitar Padu   Combined Cycle                         | 90.70 | 90.70 | 93.20 | 91.20 | 90.50 | 90.60 | 84.95 | 88.57 | 94.14 | 95.1  |
| Kitar Terbuka   Open Cycle                          | 97.00 | 98.10 | 97.30 | 98.40 | 92.60 | 97.90 | 97.56 | 94.53 | 94.14 | 95.1  |
| Konvensional (Minyak/Gas)<br>Conventional (Oil/Gas) | 99.90 | 78.10 | 99.30 | 83.20 | 98.10 | 88.20 | 82.46 | 87.43 | 88.53 | 85.42 |
| Konvensional (Arang Batu)<br>Conventional (Coal)    | -     | 78.50 | -     | 78.00 | -     | 84.30 | -     | 80.52 | -     | 84.18 |
| Hidro   Hydro                                       | 91.30 | -     | 95.30 | -     | 86.00 | -     | 92.34 | -     | 90.77 | -     |

**Jadual 3: Purata Faktor Henti Tugas Tidak Berjadual Setara (EUOF) (%)**

Table 3: Average Equivalent Unplanned Outage Factor (EUOF) (%)

| Jenis Loji<br>Plant Type                            | 2008 |       | 2009 |       | 2010 |      | 2011  |       | 2012 |      |
|---|------|-------|------|-------|------|------|-------|-------|------|------|
|   | TNB  | IPP   | TNB  | IPP   | TNB  | IPP  | TNB   | IPP   | TNB  | IPP  |
| Kitar Padu   Combined Cycle                         | 2.11 | 1.07  | 1.61 | 3.31  | 2.29 | 2.97 | 5.50  | 3.95  | 3.48 | 3.27 |
| Kitar Terbuka   Open Cycle                          | 1.73 | 0.71  | 0.93 | 0.61  | 3.99 | 0.89 | 0.98  | 0.71  | 1.32 | 1.71 |
| Konvensional (Minyak/Gas)<br>Conventional (Oil/Gas) | n/a  | 5.12  | n/a  | 11.85 | 0.33 | 4.38 | 17.53 | 5.62  | 0.46 | 2.96 |
| Konvensional (Arang Batu)<br>Conventional (Coal)    | -    | 11.17 | -    | 12.40 | -    | 7.77 | -     | 10.61 | -    | 6.07 |
| Hidro   Hydro                                       | n/a  | -     | 1.35 | -     | 0.37 | -    | 0.93  | -     | 1.9  | -    |

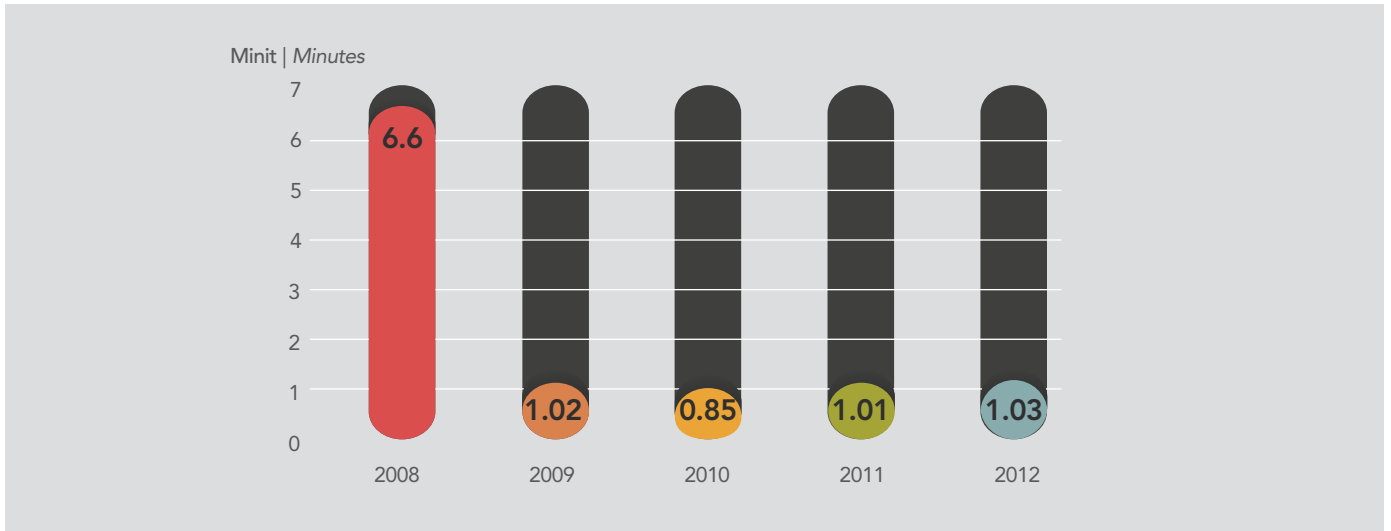
Nota | Note:

n/a – Tiada maklumat | Not available





**Carta 1: Delivery Point Unreliability Index (DePUI) - System Minutes TNB**  
 Chart 1: Delivery Point Unreliability Index (DePUI) - System Minutes TNB



Tahun Kewangan 2011/12 | Financial Year 2011/12

**Carta 2: Insiden Pelantikan bagi Talian/Kabel per 100 cct-km Bulanan**  
 Carta 2: Monthly Tripping Incidents for Lines/Cables per 100 cct-km

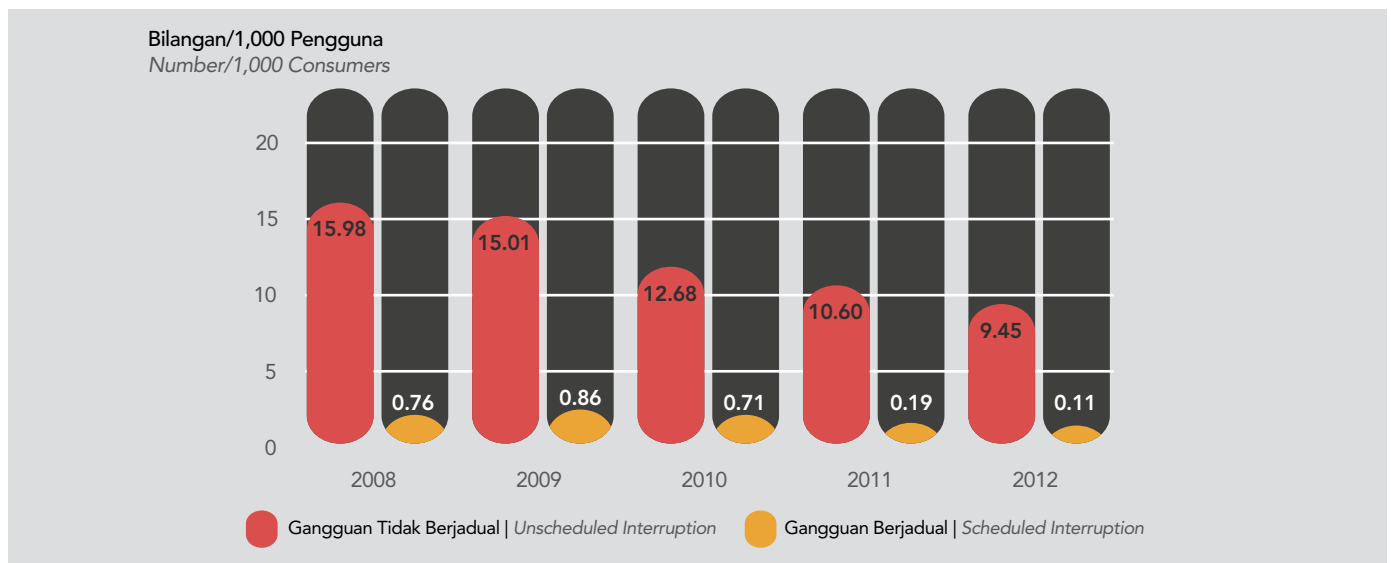


## Sistem Pengagihan TNB

### TNB Distribution System

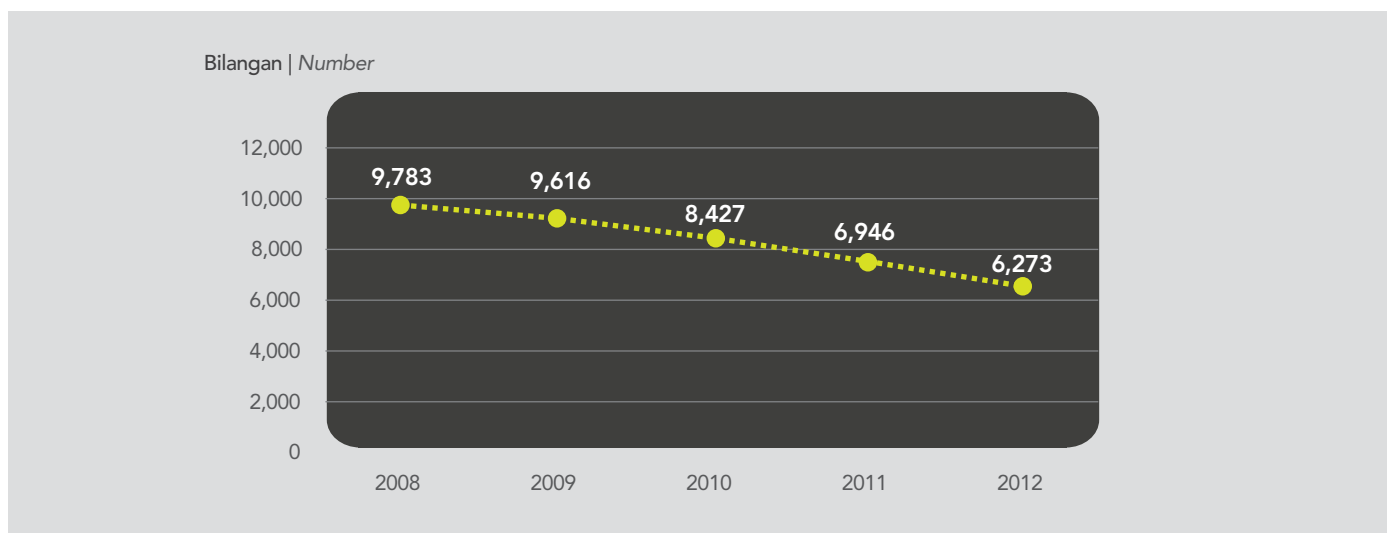
**Carta 3: Gangguan Bekalan Elektrik per 1,000 Pengguna**

**Chart 3: Electricity Supply Interruptions per 1,000 Consumers**



**Carta 4: Purata Gangguan Bekalan Elektrik Bulanan**

**Chart 4: Monthly Average Electricity Supply Interruptions**



**Jadual 6: Gangguan Bekalan Elektrik mengikut Negeri**

Table 6: Electricity Supply Interruptions by State

| Negeri   State                                    | 2008           | 2009           | 2010           | 2011          | 2012          |
|---|----------------|----------------|----------------|---------------|---------------|
| Perak   | 11,308         | 11,673         | 10,835         | 8,930         | 7,958         |
| Kedah   | 9,448          | 9,604          | 7,901          | 7,635         | 6,590         |
| Johor   | 19,960         | 18,873         | 16,590         | 12,540        | 11,935        |
| Pulau Pinang                                      | 10,711         | 8,610          | 7,376          | 5,662         | 6,269         |
| Kelantan  | 12,499         | 13,615         | 10,151         | 8,211         | 7,843         |
| Selangor  | 16,176         | 16,015         | 14,569         | 11,885        | 9,745         |
| Perlis  | 1,900          | 2,029          | 772            | 1,240         | 420           |
| Kuala Lumpur                                      | 13,962         | 12,901         | 11,970         | 9,620         | 10,481        |
| Putrajaya / Cyberjaya                             | 28             | 8              | 13             | 8             | 7             |
| Negeri Sembilan                                   | 6,148          | 6,397          | 6,461          | 5,248         | 4,876         |
| Melaka  | 4,529          | 4,973          | 4,131          | 4,772         | 2,318         |
| Pahang  | 5,760          | 6,538          | 5,621          | 4,226         | 4,039         |
| Terengganu  | 4,965          | 3,735          | 3,866          | 3,370         | 3,150         |
| <b>Semenanjung Malaysia   Peninsular Malaysia</b> | <b>117,394</b> | <b>115,392</b> | <b>101,126</b> | <b>83,347</b> | <b>75,271</b> |

**Jadual 7: Gangguan Bekalan Elektrik mengikut Tahap Voltan**

Table 7: Electricity Supply Interruptions by Voltage Level

| Tahap Voltan   Voltage Level   | 2008           | 2009           | 2010           | 2011          | 2012          |
|--|----------------|----------------|----------------|---------------|---------------|
| Voltan Tinggi   High Voltage<br>(66 kV dan ke atas   66kV and above) | 35             | 30             | 24             | 26            | 17            |
| Voltan Sederhana   Medium Voltage (6.6 kV – 33 kV)                   | 12,671         | 13,438         | 12,170         | 9,681         | 8,376         |
| Voltan Rendah   Low Voltage<br>(1kV dan ke bawah   1kV and below)    | 104,688        | 101,924        | 88,932         | 73,640        | 66,878        |
| <b>Jumlah   Total</b>  | <b>117,394</b> | <b>115,392</b> | <b>101,126</b> | <b>83,347</b> | <b>75,271</b> |

**Jadual 8: Bilangan Gangguan Bekalan Elektrik**

Table 8: Number of Electricity Supply Interruptions

| Bilangan   Number  | 2008           | 2009           | 2010           | 2011          | 2012          |
|--|----------------|----------------|----------------|---------------|---------------|
| Gangguan Tidak Berjadual<br><i>Unscheduled Interruptions</i> | 112,064        | 108,708        | 94,940         | 81,860        | 74,436        |
| Gangguan Berjadual   <i>Scheduled Interruptions</i>          | 5,330          | 6,263          | 6,011          | 1,487         | 835           |
| <b>Jumlah Gangguan   Total Interruptions</b>                 | <b>117,394</b> | <b>115,392</b> | <b>101,126</b> | <b>83,347</b> | <b>75,271</b> |



**Jadual 9: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan**

Table 9: Percentage of Unscheduled Supply Interruptions by Type of Interruptions

| Punca Gangguan   Type of Interruption | Voltan Rendah<br>Low Voltage | Voltan Sederhana<br>Medium Voltage | Jumlah<br>Total | Peratus<br>Percentage (%) |
|---------------------------------------|------------------------------|------------------------------------|-----------------|---------------------------|
| Haiwan   Animal                       | 750                          | 495                                | 1,245           | 1.65                      |
| Kabel   Cable                         | 2,144                        | 1,448                              | 3,592           | 4.77                      |
| Auto Reclose                          | -                            | 5                                  | 5               | 0.01                      |
| Konduktor   Conductor                 | 9,680                        | 305                                | 9,985           | 13.27                     |
| Feeder Pillar                         | 1,876                        | -                                  | 1,876           | 2.49                      |
| Banjir   Flood                        | 1                            | 4                                  | 4               | 0.01                      |
| Fius   Fuse                           | 3,841                        | 4                                  | 3,845           | 5.11                      |
| Kotak Fius   Fuse Box                 | 8,709                        | 30                                 | 8,739           | 11.61                     |
| Insulated Piercing Connector (IPC)    | 22,756                       | -                                  | 22,756          | 30.24                     |
| Penebat   Insulator                   | -                            | 6                                  | 6               | 0.02                      |
| Sendi   Joint                         | 13                           | 3,945                              | 3,958           | 5.26                      |
| Pautan   Link                         | 54                           | 9                                  | 63              | 0.08                      |
| Lain-lain   Others                    | 38                           | 512                                | 550             | 0.73                      |
| Pokok   Trees                         | 10,665                       | 88                                 | 10,753          | 14.29                     |
| Jumper                                | -                            | 16                                 | 16              | 0.02                      |
| Tiang   Pole                          | 2,376                        | 75                                 | 2,451           | 3.26                      |
| Ribut   Storm                         | 382                          | 20                                 | 402             | 0.53                      |
| Geganti   Relay                       | -                            | 35                                 | 35              | 0.05                      |
| Peralatan Suis   Switchgear           | -                            | 198                                | 198             | 0.26                      |
| Tamatan   Termination                 | 164                          | 72                                 | 236             | 0.31                      |
| Pihak Ketiga   Third Party            | 3,140                        | 765                                | 3,905           | 5.19                      |
| Alatubah   Transformer                | -                            | 107                                | 107             | 0.14                      |
| Ubahtika   Transient                  | -                            | 203                                | 203             | 0.27                      |
| Vandalisma   Vandalisme               | 289                          | 34                                 | 323             | 0.43                      |
| <b>Total   Jumlah</b>                 | <b>66,878</b>                | <b>8,376</b>                       | <b>75,253</b>   | <b>100.00</b>             |

Nota | Note:

Tidak Termasuk Gangguan Voltan Tinggi | Excluding High Voltage Interruptions

## TNB System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI)

Jadual 10: SAIDI (Minit/Pelanggan/Tahun) mengikut Tahap Voltan

Table 10: SAIDI (Minutes/Customer/Year) by Voltage Level

| Tahap Voltan   Voltage Level   | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| Voltan Tinggi (66 kV dan ke atas)<br>High Voltage (66kV and above)   | 3.21  | 1.05  | 1.17  | 0.94  | 6.87  |
| Voltan Sederhana (6.6 kV – 33 kV)<br>Medium Voltage (6.6 kV – 33 kV) | 68.31 | 56.72 | 88.1  | 63.25 | 49.3  |
| Voltan Rendah (1kV dan ke bawah)<br>Low Voltage (1kV and below)      | 15.79 | 8.30  | 6.98  | 4.93  | 4.29  |
| Jumlah   Total   | 87.3  | 66.1  | 96.25 | 69.11 | 60.46 |

Nota | Note:

2008 – 2009: pengukuran SAIDI menggunakan TOMS | SAIDI measured by TOMS

2010 – 2012: pengukuran SAIDI menggunakan Enhanced TOMS | SAIDI measured by Enhanced TOMS

Jadual 11: SAIDI (Minit/Pelanggan/Tahun) mengikut Negeri

Table 11: SAIDI (Minutes/Customer/Year) by State

| Negeri   State                             | 2008   | 2009   | 2010   | 2011   | 2012  |
|--|--------|--------|--------|--------|-------|
| Perak                                      | 61.26  | 67.51  | 194.71 | 119.73 | 83.61 |
| Kedah                                      | 116.55 | 77.21  | 127.66 | 87.18  | 81.36 |
| Johor                                      | 120.47 | 79.88  | 119.95 | 78.05  | 61.77 |
| Pulau Pinang                               | 104.43 | 111.28 | 109.62 | 76.56  | 73.29 |
| Kelantan                                   | 99.21  | 81.86  | 85.01  | 72.78  | 72.35 |
| Selangor                                   | 69.97  | 48.86  | 79.73  | 61.35  | 56.69 |
| Perlis                                     | 56.83  | 53.25  | 64.64  | 37.80  | 35.24 |
| Kuala Lumpur                               | 67.92  | 47.24  | 41.94  | 33.46  | 33.69 |
| Putrajaya / Cyberjaya                      | 6.57   | 0.23   | 9.08   | 0.22   | 8.48  |
| Negeri Sembilan                            | 79.36  | 53.32  | 81.38  | 55.94  | 54.60 |
| Melaka                                     | 98.80  | 60.69  | 60.47  | 43.52  | 45.64 |
| Pahang                                     | 102.76 | 61.76  | 74.35  | 88.96  | 62.15 |
| Terengganu                                 | 72.94  | 49.08  | 55.57  | 54.26  | 50.29 |
| Semenanjung Malaysia   Peninsular Malaysia | 87.31  | 66.07  | 96.25  | 69.11  | 60.46 |

**Jadual 12: SAIFI (Bilangan Gangguan/Pelanggan/Year) mengikut Tahap Voltan**

Table 12: SAIFI (Number of Interruptions/Customers/Year) by Voltage Level

| Tahap Voltan   Voltage Level   | 2008  | 2009 | 2010 | 2011 | 2012 |
|--|-------|------|------|------|------|
| Voltan Tinggi (66 kV dan ke atas)<br>High Voltage (66kV and above)   | 0.017 | 0.02 | 0.01 | 0.01 | 0.01 |
| Voltan Sederhana (6.6 kV – 33 kV)<br>Medium Voltage (6.6 kV – 33 kV) | 0.759 | 0.67 | 1.17 | 0.93 | 0.80 |
| Voltan Rendah   Low Voltage<br>(1kV dan ke bawah   1kV and below)    | 0.091 | 0.06 | 0.05 | 0.02 | 0.00 |
| Jumlah   Total   | 0.87  | 0.76 | 1.23 | 0.97 | 0.81 |

**Jadual 13: SAIFI (Bilangan Gangguan/Pelanggan/Year) mengikut Negeri**

Table 13: SAIFI (Number of Interruptions/Customers/Year) by State

| Negeri   State                             | 2008 | 2009 | 2010 | 2011 | 2012 |
|--|------|------|------|------|------|
| Perak                                      | 0.93 | 0.86 | 2.35 | 1.81 | 0.21 |
| Kedah                                      | 1.09 | 0.87 | 1.76 | 1.32 | 0.29 |
| Johor                                      | 0.87 | 0.67 | 1.57 | 0.95 | 0.12 |
| P. Pinang                                  | 1.41 | 1.50 | 1.46 | 1.06 | 0.16 |
| Kelantan                                   | 1.16 | 1.25 | 1.75 | 1.48 | 0.24 |
| Selangor                                   | 0.65 | 0.50 | 0.95 | 0.86 | 0.12 |
| Perlis                                     | 0.73 | 0.68 | 0.86 | 0.48 | 0.05 |
| Kuala Lumpur                               | 0.52 | 0.52 | 0.48 | 0.44 | 0.03 |
| Putrajaya / Cyberjaya                      | 0.03 | 0.00 | 0.04 | 0.00 | 0.00 |
| N. Sembilan                                | 0.64 | 0.57 | 0.87 | 0.64 | 0.10 |
| Melaka                                     | 1.03 | 0.86 | 0.71 | 0.60 | 0.15 |
| Pahang                                     | 0.96 | 0.73 | 0.90 | 1.24 | 0.19 |
| Terengganu                                 | 1.22 | 0.96 | 1.22 | 1.29 | 0.16 |
| Semenanjung Malaysia   Peninsular Malaysia | 0.87 | 0.76 | 1.23 | 0.97 | 0.81 |

**Jadual 14: CAIDI (Minit/Pelanggan Terlibat/Tahun) mengikut Tahap Voltan**

Table 14: CAIDI (Minutes/Involved Customer/Year) by Voltage Level

| Tahap Voltan   Voltage Level  | 2008   | 2009   | 2010  | 2011   | 2012   |
|---|--------|--------|-------|--------|--------|
| Voltan Tinggi (66 kV dan ke atas)<br><i>High Voltage (66kV and above)</i>   | 189.00 | 47.47  | 114.6 | 92.00  | 687.00 |
| Voltan Sederhana (6.6 kV – 33 kV)<br><i>Medium Voltage (6.6 kV – 33 kV)</i> | 90.00  | 84.05  | 75.5  | 68.04  | 61.63  |
| Voltan Rendah   Low Voltage<br>(1kV dan ke bawah   1kV and below)           | 173.46 | 133.14 | 136.9 | 245.60 | 429.00 |
| Jumlah   Total  | 100.7  | 87.01  | 78.3  | 71.62  | 74.64  |

**Jadual 15: CAIDI (Minit/Pelanggan Terlibat/Tahun) mengikut Negeri**

Table 15: CAIDI (Minutes/Involved Customer/Year) by State

| Negeri   State                             | 2008   | 2009   | 2010   | 2011  | 2012  |
|--|--------|--------|--------|-------|-------|
| Perak                                      | 65.57  | 78.22  | 82.93  | 65.39 | 66.52 |
| Kedah                                      | 106.73 | 89.14  | 72.50  | 55.55 | 47.45 |
| Johor                                      | 137.88 | 119.02 | 76.19  | 77.25 | 73.07 |
| Pulau Pinang                               | 74.06  | 74.25  | 75.09  | 64.43 | 67.06 |
| Kelantan                                   | 85.70  | 65.34  | 48.53  | 89.94 | 54.80 |
| Selangor                                   | 108.29 | 96.95  | 83.77  | 63.07 | 66.77 |
| Perlis                                     | 77.76  | 78.09  | 75.49  | 95.73 | 72.67 |
| Kuala Lumpur                               | 130.37 | 91.56  | 87.30  | 62.88 | 98.59 |
| Putrajaya / Cyberjaya                      | 225.55 | 98.92  | 211.99 | 52.00 | 38.78 |
| Negeri Sembilan                            | 123.22 | 112.06 | 93.59  | 79.68 | 82.21 |
| Melaka                                     | 96.39  | 70.55  | 85.14  | 89.32 | 73.74 |
| Pahang                                     | 107.40 | 84.86  | 82.16  | 42.69 | 57.46 |
| Terengganu                                 | 59.97  | 50.99  | 45.72  | 83.62 | 49.12 |
| Semenanjung Malaysia   Peninsular Malaysia | 100.70 | 87.01  | 78.25  | 71.62 | 74.64 |

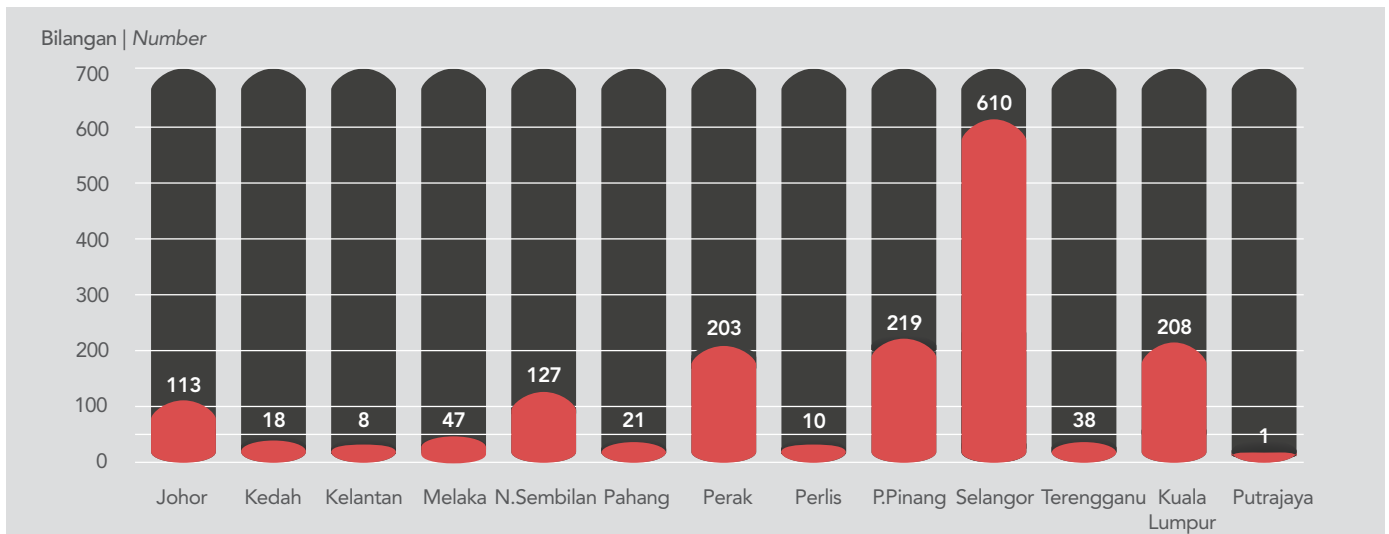


## Kualiti Pembekalan Elektrik TNB

### TNB Electricity Supply Quality

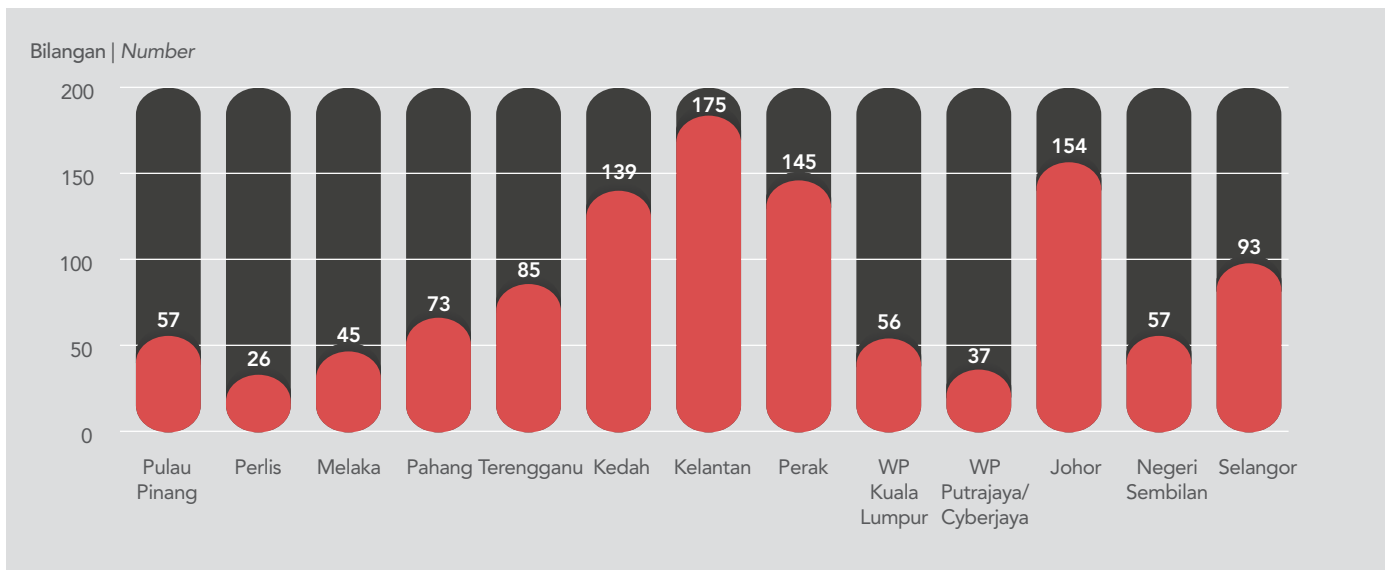
**Carta 5: Kejadian Voltan Luar Biasa**

Chart 5: Reported Overvoltage Incidents



**Carta 6: Kejadian Junaman Voltan yang dilaporkan mengikut Negeri**

Chart 6: Reported Voltage Dip Incidents by State



**Jadual 16: Bilangan Pengguna Terlibat dalam Insiden Junaman Voltan mengikut Negeri***Table 16: Number of Consumers Involved in Voltage Dip Incidents by State*

| Negeri   State                             | 2008 | 2009 | 2010 | 2011 | 2012 |
|--|------|------|------|------|------|
| Pulau Pinang                               | 17   | 12   | 3    | 6    | 7    |
| Perlis                                     | 0    | 0    | 0    | 0    | 0    |
| Melaka                                     | 0    | 0    | 2    | 3    | 2    |
| Pahang                                     | 10   | 2    | 4    | 3    | 1    |
| Terengganu                                 | 1    | 0    | 0    | 0    | 1    |
| Kedah                                      | 1    | 0    | 2    | 2    | 0    |
| Kelantan                                   | 0    | 0    | 9    | 1    | 0    |
| Perak                                      | 5    | 33   | 22   | 13   | 5    |
| WP Kuala Lumpur                            | 34   | 32   | 18   | 1    | 6    |
| WP Putrajaya / Cyberjaya                   | 0    | 0    | 0    | 0    | 0    |
| Johor                                      | 9    | 7    | 6    | 7    | 7    |
| Negeri Sembilan                            | 45   | 7    | 18   | 3    | 3    |
| Selangor                                   | 90   | 14   | 91   | 12   | 16   |
| Semenanjung Malaysia   Peninsular Malaysia | 212  | 107  | 175  | 51   | 48   |

**Jadual 17: SARFI (System Average RMS Frequency Index)***Table 17: SARFI (System Average RMS Frequency Index)*

| Sistem TNB   TNB System             | SARFI <sub>90</sub> | SARFI <sub>80</sub> | SARFI <sub>70</sub> |
|-------------------------------------|---------------------|---------------------|---------------------|
| 11 kV                               | 6.3                 | 3.7                 | 2.1                 |
| 22 kV                               | 7.8                 | 5.6                 | 3.9                 |
| 33 kV                               | 8.1                 | 4.1                 | 2.9                 |
| Sistem Keseluruhan   Overall System | 6.8                 | 3.9                 | 2.6                 |

**Jadual 18: SARFI (System Average RMS Frequency Index): Perbandingan dengan Syarikat Utiliti yang Terpilih***Table 18: SARFI (System Average RMS Frequency Index): Comparison with Selected Power Utility Companies*

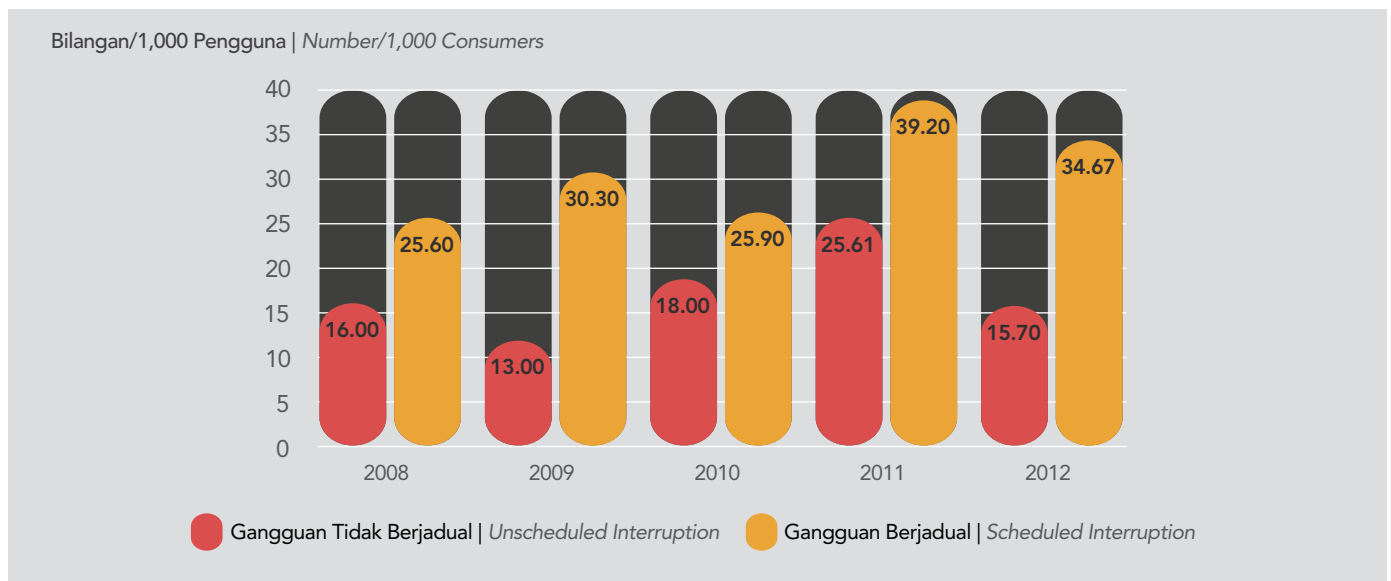
| Utiliti Elektrik   Electricity Utility | SARFI <sub>90</sub> | SARFI <sub>80</sub> | SARFI <sub>70</sub> |
|--|---------------------|---------------------|---------------------|
| Singapore Power Grid                   | 3                   | 0.7                 | 0.4                 |
| United State DPQ Project               | 50                  | 27.3                | 18                  |
| Europe Mixed Systems (UNIPED)          | 103                 | 0                   | 44                  |
| Europe Cable Systems (UNIPED)          | 35                  | 0                   | 11                  |
| South Africa NRS-048 Indicate Level    | 153                 | 78                  | 47                  |
| Tenaga Nasional Berhad                 | 6.8                 | 3.9                 | 2.6                 |

### Sistem Pengagihan NUR Distribution Sdn. Bhd. (NUR Distribution)

NUR Distribution Sdn. Bhd. (NUR Distribution) Distribution System

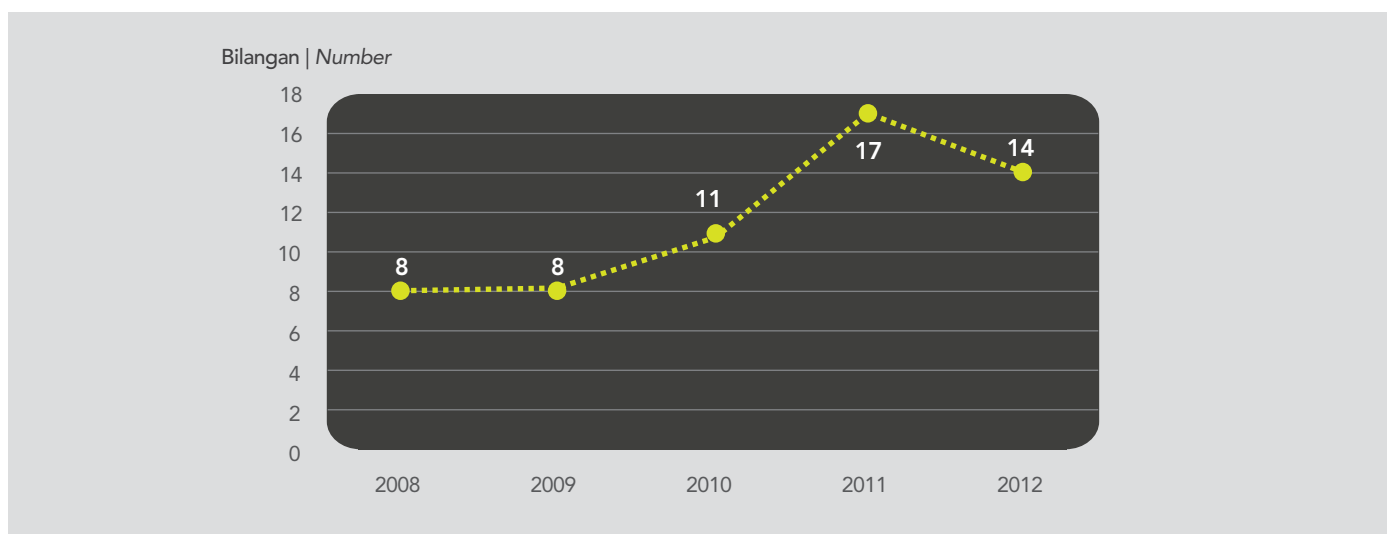
**Carta 7: Gangguan Bekalan Elektrik per 1,000 Pengguna**

Chart 7: Electricity Supply Interruptions per 1,000 Consumers



**Carta 8: Purata Gangguan Bekalan Elektrik Bulanan**

Chart 8: Monthly Average Electricity Supply Interruptions



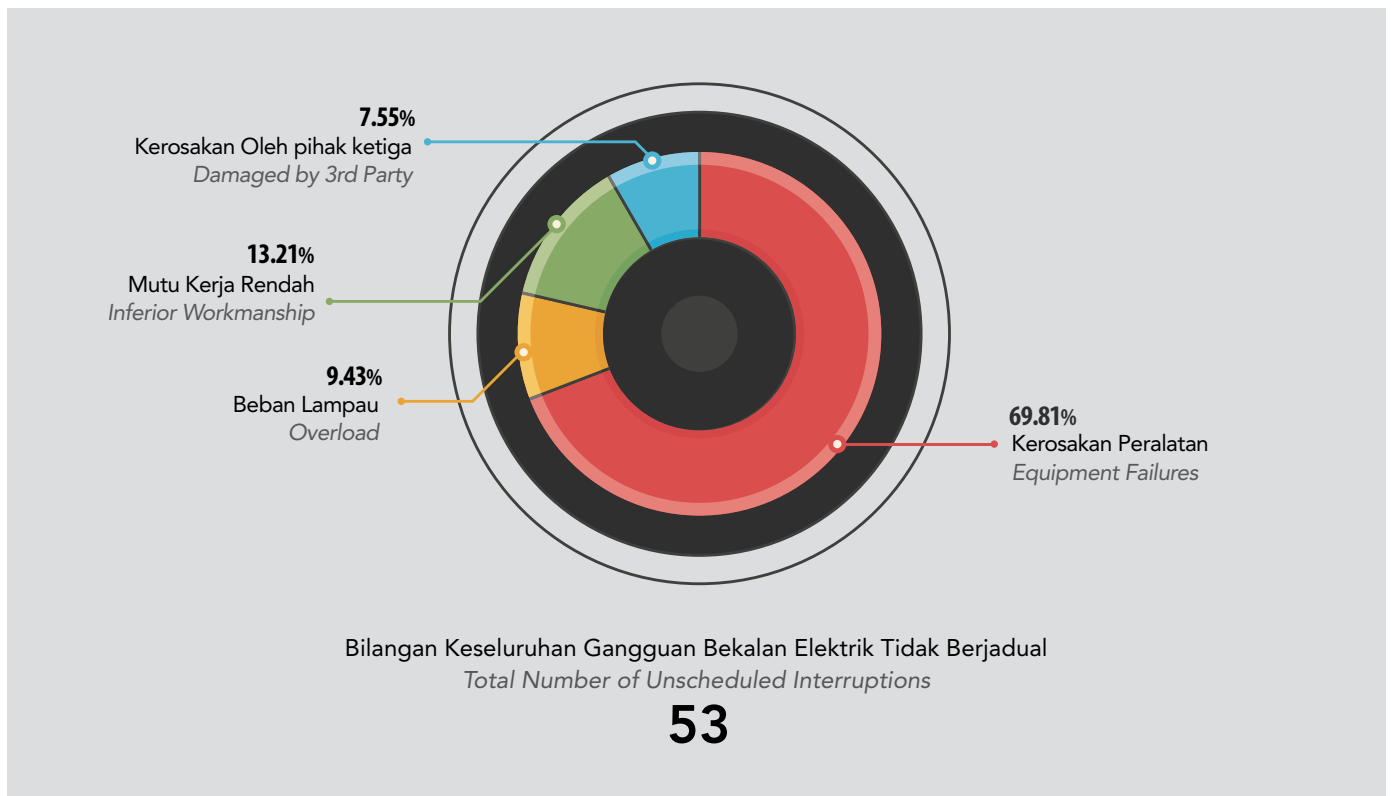
**Jadual 19: Bilangan Gangguan Bekalan Elektrik**

Table 19: Number of Electricity Supply Interruptions

| Bilangan   Number   | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|
| Gangguan Tidak Berjadual   <i>Unscheduled Interruptions</i> | 35   | 30   | 53   | 81   | 53   |
| Gangguan Berjadual   <i>Scheduled Interruptions</i>         | 56   | 70   | 76   | 124  | 117  |
| Jumlah Gangguan   <i>Total Interruptions</i>                | 91   | 100  | 129  | 205  | 170  |

**Carta 9: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan**

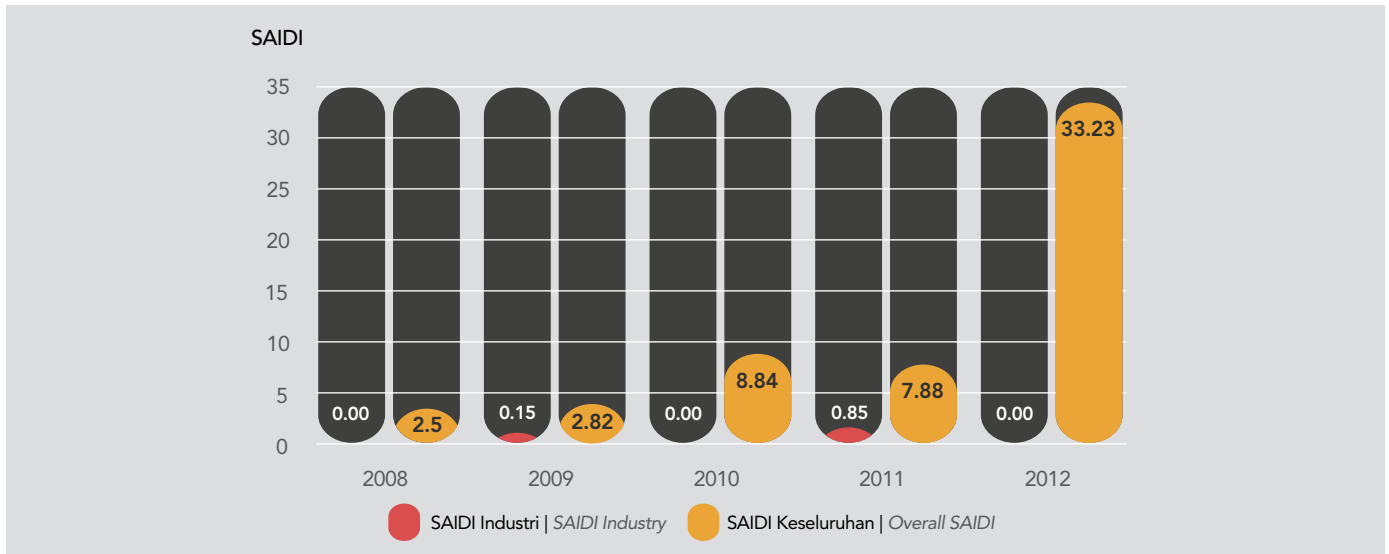
Chart.9: Percentage of Unscheduled Supply Interruption by Type of Interruptions



## System Average Interruption Duration Index (SAIDI) of NUR Distribution

**Carta 10: SAIDI (Minit/ Pelanggan/ Tahun)**

Chart 10: SAIDI (Minutes/Customer/ Year)



**Nota | Note:**

SAIDI 2012 meningkat disebabkan kerosakan kabel 11kV pada April 2012 dan September 2012 yang melibatkan ramai pengguna. Kerosakan ini menyumbang sebanyak 29.2 minit/pelanggan/tahun atau 88 peratus daripada SAIDI keseluruhan tahun 2012

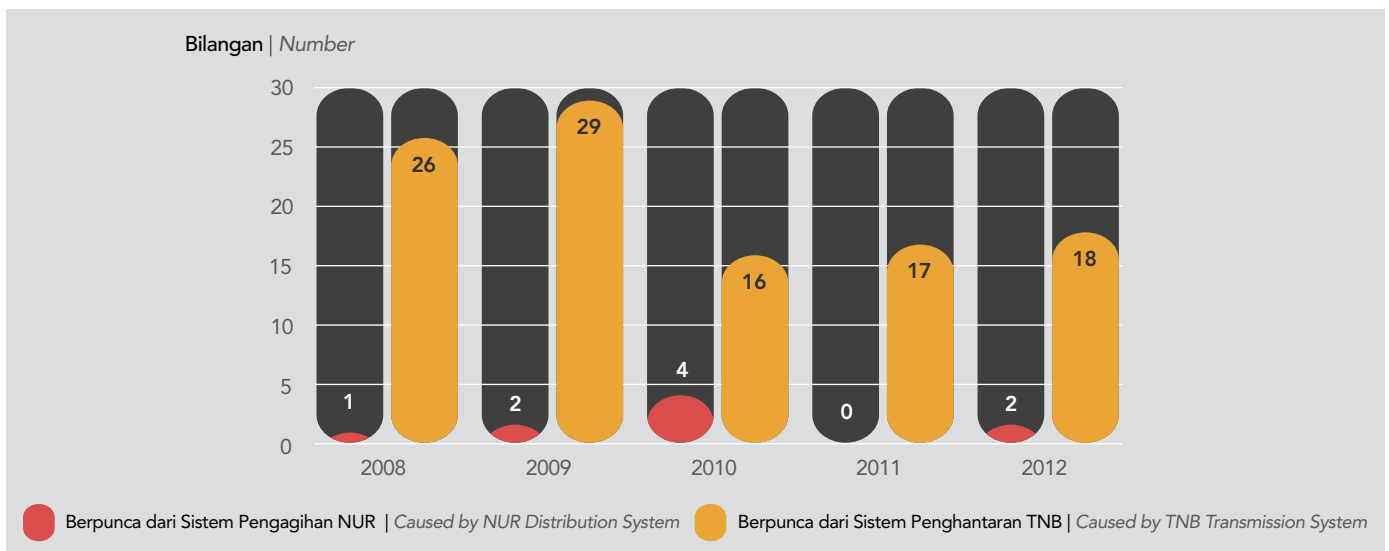
SAIDI 2012 increased due to fault of 11kV cable in April 2012 and September 2012 involving a big number of customers. The damages accounted for 29.2 minutes/customer/year or 88 percent of the overall SAIDI in 2012

## Kualiti Pembekalan Elektrik NUR Distribution

NUR Distribution Electricity Supply Quality

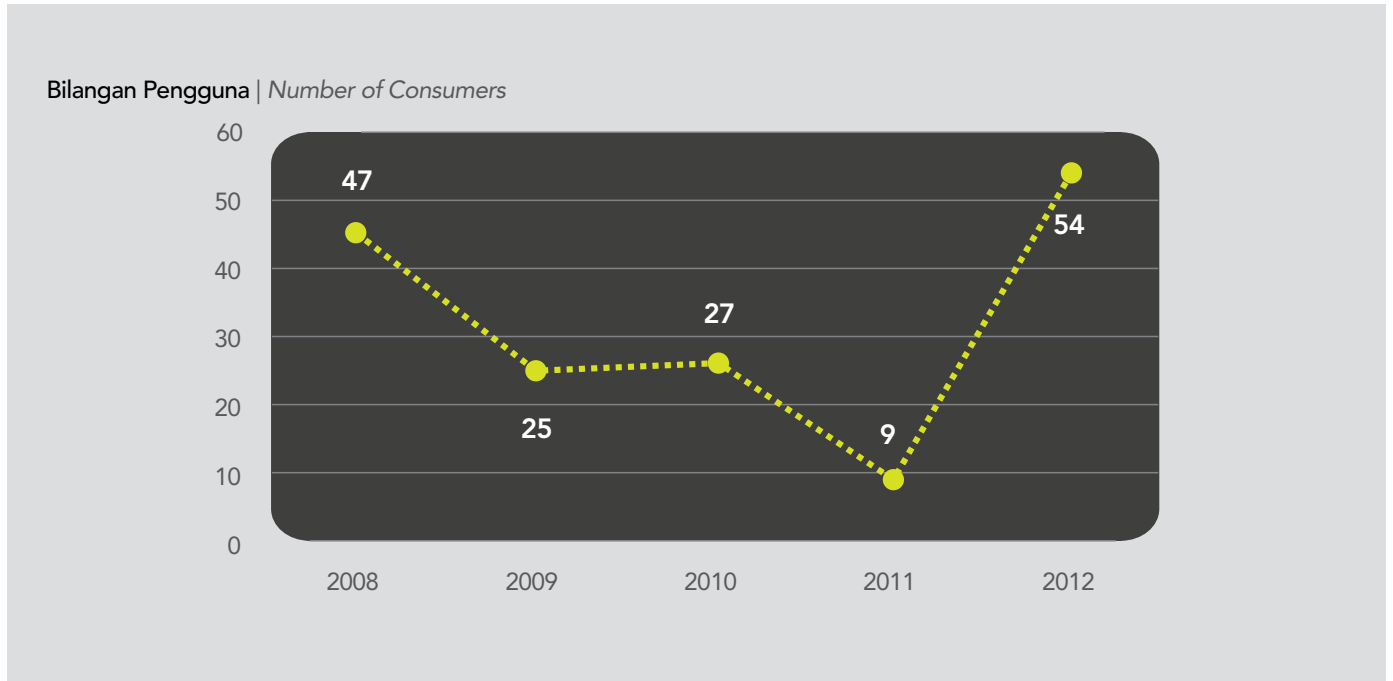
**Carta 11: Kejadian Junaman Voltan yang Dilaporkan di KHTP**

Chart 11: Reported Voltage Dips Incidents in KHTP





**Carta 12: Bilangan Pengguna yang Terlibat dengan Insiden Junaman Voltan**  
 Chart 12: Number of Consumers Involved in Voltage Dips Incidents



**Jadual 20: SARFI (System Average RMS Frequency Index)**  
 Table 20: SARFI (System Average RMS Frequency Index)

|  | 2008 | 2009 | 2010 | 2011 | 2012 |
|--|------|------|------|------|------|
| Berpunca Dari Sistem Pengagihan NUR<br>Caused by NUR Distribution System   | 0    | 1    | 1    | 0    | 1    |
| Berpunca Dari Sistem Penghantaran TNB<br>Caused by TNB Transmission System | 2    | 1    | 1    | 0    | 2    |



| No.  | Service Dimension | Service Indicator  | Target          | Penalty | Kedah     | Selangor  | Pulau Pinang | Johor     | Perak     | Kuala Lumpur | Pahang  | Kelantan | Terengganu | Negeri Sembilan | Perlis | Melaka | Putrajaya/Cyberjaya | Total     |     |
|--|-------------------|--|-----------------|---------|-----------|-----------|--------------|-----------|-----------|--------------|---------|----------|------------|-----------------|--------|--------|---------------------|-----------|-----|
| GSL 3  | Providing Supply  | Time taken to implement service connection (underground cable) requiring low voltage cable installation work | 21 working days | RM50    |           |           |              |           |           |              |         |          |            |                 |        |        |                     |           |     |
|  |                   | Total service connection   |                 |         | 259       | 1,647     | 409          | 715       | 336       | 1,438        | 368     | 291      | 360        | 273             | 84     | 286    | 88                  | 6,554     |     |
|  |                   | Total service connection not completed in 21 working days  |                 |         | 42        | 236       | 98           | 40        | 48        | 105          | 21      | 34       | 11         | 31              | 0      | 6      | 14                  | 686       |     |
|  |                   | Total penalty (RM)   |                 |         | 2,100     | 11,800    | 4,900        | 2,000     | 2,400     | 5,250        | 1,050   | 1,700    | 550        | 1,550           | 0      | 300    | 700                 | 34,300    |     |
| GSL 4  | Providing Supply  | Time taken to connect new electricity supply for individual domestic low voltage consumer                    | 5 working days  | RM50    |           |           |              |           |           |              |         |          |            |                 |        |        |                     |           |     |
|  |                   | Total supply connection  |                 |         | 12,736    | 19,017    | 11,862       | 19,091    | 15,358    | 11,567       | 7,674   | 8,872    | 8,387      | 8,095           | 1,756  | 6,084  | 153                 | 130,652   |     |
|  |                   | Total supply connection not completed in 5 working days  |                 |         | 146       | 452       | 62           | 281       | 105       | 335          | 13      | 19       | 8          | 41              | 0      | 11     | 2                   | 1,475     |     |
|  |                   | Total penalty (RM)   |                 |         | 7,300     | 22,600    | 3,100        | 14,050    | 5,250     | 16,750       | 650     | 950      | 400        | 2,050           | 0      | 550    | 100                 | 73,750    |     |
| GSL 5  | Customer Contact  | Disconnection of supply according to the applicable legislation or disconnection procedures                  | 0               | RM100   |           |           |              |           |           |              |         |          |            |                 |        |        |                     |           |     |
|  |                   | Total disconnection  |                 |         | 113,227   | 132,595   | 78,362       | 86,442    | 128,968   | 143,091      | 39,891  | 66,332   | 47,830     | 70,255          | 9,427  | 39,646 | 9,883               | 965,949   |     |
|  |                   | Total disconnection not done with procedures   |                 |         | 0         | 0         | 1            | 0         | 0         | 2            | 0       | 0        | 0          | 0               | 0      | 0      | 0                   | 0         | 3   |
|  |                   | Total penalty (RM)   |                 |         | 0         | 0         | 100          | 0         | 0         | 200          | 0       | 0        | 0          | 0               | 0      | 0      | 0                   | 0         | 300 |
| <b>Total Penalty in RM for GSL 1, 2, 3, 4, 5 according to states</b> |                   |  |                 |         | 1,676,130 | 1,652,370 | 1,313,100    | 1,204,240 | 1,152,440 | 865,480      | 820,000 | 285,230  | 143,030    | 70,920          | 45,610 | 4,050  | 1,030               | 9,233,630 |     |
| <b>Total Penalty in RM - Nationwide (GSL 1, 2, 3, 4, 5)</b>          |                   |  |                 |         | 9,233,630 |           |              |           |           |              |         |          |            |                 |        |        |                     |           |     |

Nota 1 Note:  
 \*GSL 1 & 2 hanya akan berkuatkuasa selepas Sistem Maklumat Korporat Geospasial (CGIS) disiapkan I GSL 1 & 2 will only take effects after the Corporate Geospatial Information System (CGIS) is completed  
 Sumber 1 Source: Tenaga Nasional Berhad

**Prestasi Perkhidmatan TNB (Minimum Service Level (MSL))**  
**TNB Service Performance (Minimum Service Level (MSL))**

| No. | Service Indicator   | Service Standard | Perlis | Melaka | Pulau Pinang | Negeri Sembilan | Pahang | Kuala Lumpur | Terengganu | Selangor | Putrajaya/Cyberjaya | Johor  | Perak  | Kedah  | Kelantan | Total/Average % |
|-----|---|------------------|--------|--------|--------------|-----------------|--------|--------------|------------|----------|---------------------|--------|--------|--------|----------|-----------------|
| 1   | <b>Availability of Supply</b>   |                  |        |        |              |                 |        |              |            |          |                     |        |        |        |          |                 |
|     | 1a. Minimum duration of notice for planned / scheduled interruptions of electricity supply                      | > 2 days         | 71     | 519    | 1,849        | 1,193           | 545    | 1,379        | 195        | 6,430    | 0                   | 2,075  | 1,469  | 614    | 848      | 17,187          |
|     | Total notices served more than 2 days before planned/scheduled interruptions                                    |                  | 71     | 517    | 1,838        | 1,188           | 537    | 1,352        | 190        | 6,336    | 0                   | 2,042  | 1,452  | 605    | 819      | 16,947          |
|     | (%) Compliance  |                  | 100.00 | 99.61  | 99.41        | 99.58           | 98.53  | 98.04        | 97.44      | 98.54    | 0                   | 98.41  | 98.84  | 98.53  | 96.58    | 98.60           |
|     | 1b. Upon request, time taken to provide initial information to consumer who report on electricity interruptions |                  |        |        |              |                 |        |              |            |          |                     |        |        |        |          |                 |
| 2   | <b>Quality of Supply</b>  |                  |        |        |              |                 |        |              |            |          |                     |        |        |        |          |                 |
|     | 2a. Time taken to rectify voltage complaint or limit violation  | < 2 days         | 18,736 | 18,736 | 18,736       | 18,736          | 18,736 | 18,736       | 18,736     | 18,736   | 18,736              | 18,736 | 18,736 | 18,736 | 18,736   | 18,736          |
|     | Total complaints received   |                  | 0      | 1      | 4            | 38              | 0      | 1            | 155        | 12       | 0                   | 0      | 6      | 1      | 5        | 223             |
|     | Total complaints solved within 2 days   |                  | 0      | 1      | 4            | 35              | 0      | 1            | 153        | 10       | 0                   | 0      | 5      | 1      | 3        | 213             |
|     | (%) Compliance  |                  | 97.53  | 97.53  | 97.53        | 97.53           | 97.53  | 97.53        | 97.53      | 97.53    | 97.53               | 97.53  | 97.53  | 97.53  | 97.53    | 97.53           |
| 2   | <b>Quality of Supply</b>  |                  |        |        |              |                 |        |              |            |          |                     |        |        |        |          |                 |
|     | 2b. Time taken to correct voltage complaint which requires network reinforcement                                | < 180 days       | 0      | 1      | 2            | 1               | 0      | 0            | 0          | 0        | 0                   | 0      | 0      | 2      | 1        | 7               |
|     | Total complaints received   |                  | 0      | 1      | 2            | 1               | 0      | 0            | 0          | 0        | 0                   | 0      | 0      | 2      | 1        | 7               |
|     | Total complaints solved within 180 days   |                  | 0      | 1      | 2            | 1               | 0      | 0            | 0          | 0        | 0                   | 0      | 0      | 2      | 1        | 7               |
|     | (%) Compliance  |                  | 0      | 100.00 | 100.00       | 100.00          | 100.00 | 100.00       | 100.00     | 83.33    | 0                   | 0      | 0      | 100.00 | 100.00   | 100.00          |





| No. | Service Indicator   | Service Standard | Perlis    | Melaka    | Pulau Pinang | Negeri Sembilan | Pahang    | Kuala Lumpur | Terengganu | Selangor  | Putrajaya/Cyberjaya | Johor     | Perak     | Kedah     | Kelantan  | Total/Average % |
|-----|---|------------------|-----------|-----------|--------------|-----------------|-----------|--------------|------------|-----------|---------------------|-----------|-----------|-----------|-----------|-----------------|
| 3   | 3d. Time taken to inform the developer of the connection charges to be paid upon receipt of complete application                | < 60 days        | 30        | 117       | 176          | 156             | 134       | 138          | 49         | 686       | 29                  | 240       | 148       | 35        | 37        | 1,975           |
|     | No. of contribution charge letters issued   |                  | 30        | 114       | 168          | 154             | 124       | 130          | 39         | 658       | 29                  | 224       | 146       | 27        | 37        | 1,880           |
|     | (%) Compliance  |                  | 100.00    | 97.44     | 95.45        | 98.72           | 92.54     | 94.20        | 79.59      | 95.92     | 100.00              | 93.33     | 98.65     | 77.14     | 100.00    | 95.19           |
|     | <b>Customer Contact</b>   |                  |           |           |              |                 |           |              |            |           |                     |           |           |           |           |                 |
| 4   | 4a. Time taken to reply to written enquiry or complaint   | < 7 working days | 69        | 382       | 1,063        | 843             | 538       | 1,762        | 422        | 2,405     | 42                  | 2,397     | 1,187     | 596       | 606       | 12,312          |
|     | Total written enquiries/complaints received   |                  | 69        | 373       | 1,058        | 825             | 514       | 1,723        | 414        | 2,349     | 40                  | 2,375     | 1,154     | 580       | 558       | 12,032          |
|     | (%) Compliance  |                  | 100.00    | 97.64     | 99.53        | 97.86           | 95.54     | 97.79        | 98.10      | 97.67     | 95.24               | 99.08     | 97.22     | 97.32     | 92.08     | 97.73           |
|     | <b>4b. Average queuing time at customer service counter</b>   |                  |           |           |              |                 |           |              |            |           |                     |           |           |           |           |                 |
| 5   | Total customers served within 20 minutes  | < 20 minutes     | 60,807    | 307,475   | 553,483      | 341,096         | 319,039   | 717,328      | 177,720    | 948,334   | 41,146              | 729,851   | 530,134   | 481,647   | 194,571   | 5,402,631       |
|     | Total customers served within 30 minutes  |                  | 59,208    | 293,214   | 520,954      | 323,253         | 312,790   | 599,472      | 173,277    | 879,602   | 39,769              | 653,668   | 481,634   | 447,250   | 183,819   | 4,967,910       |
|     | (%) Compliance  |                  | 97.37     | 95.36     | 94.12        | 94.77           | 98.04     | 83.57        | 97.50      | 92.75     | 96.65               | 89.56     | 90.85     | 92.86     | 94.47     | 91.95           |
|     | <b>4c. Average time taken by customer service officer at CMC 15454 to pick up ringing telephone.</b>                            |                  |           |           |              |                 |           |              |            |           |                     |           |           |           |           |                 |
| 5   | Total incoming calls received   | < 30 seconds     | 2,559,561 | 2,559,561 | 2,559,561    | 2,559,561       | 2,559,561 | 2,559,561    | 2,559,561  | 2,559,561 | 2,559,561           | 2,559,561 | 2,559,561 | 2,559,561 | 2,559,561 | 2,559,561       |
|     | Total incoming calls answered within 30 seconds   |                  | 2,397,658 | 2,397,658 | 2,397,658    | 2,397,658       | 2,397,658 | 2,397,658    | 2,397,658  | 2,397,658 | 2,397,658           | 2,397,658 | 2,397,658 | 2,397,658 | 2,397,658 | 2,397,658       |
|     | (%) Compliance  |                  | 93.67     | 93.67     | 93.67        | 93.67           | 93.67     | 93.67        | 93.67      | 93.67     | 93.67               | 93.67     | 93.67     | 93.67     | 93.67     | 93.67           |
|     | <b>Metering Services</b>  |                  |           |           |              |                 |           |              |            |           |                     |           |           |           |           |                 |
| 5   | 5a. Time taken to attend to meter problem upon official notification/request by the consumer (appointment, visit, testing, etc) | < 2 working days | 354       | 779       | 1,373        | 663             | 231       | 550          | 59         | 1,234     | 172                 | 1,548     | 694       | 314       | 529       | 8,500           |
|     | No. of appointments, visit, testing completed   |                  | 354       | 768       | 1,347        | 614             | 225       | 534          | 58         | 1,199     | 136                 | 1,341     | 650       | 295       | 456       | 7,977           |
|     | (%) Compliance  |                  | 100.00    | 98.59     | 98.11        | 92.61           | 97.40     | 97.09        | 98.31      | 97.16     | 97.07               | 86.63     | 93.66     | 93.95     | 86.20     | 93.85           |

| No. | Service Indicator  | Service Standard | Perlis  | Melaka    | Pulau Pinang | Negeri Sembilan | Pahang    | Kuala Lumpur | Terengganu | Selangor   | Putrajaya/Cyberjaya | Johor      | Perak     | Kedah     | Kelantan  | Total/Average % |  |
|-----|--|------------------|---------|-----------|--------------|-----------------|-----------|--------------|------------|------------|---------------------|------------|-----------|-----------|-----------|-----------------|--|
| 5   | 5b. Time taken to respond to metering problem or dispute upon official notification/request by the consumer (replace, relocate, etc) | < 3 working days | 61      | 227       | 191          | 237             | 75        | 71           | 32         | 379        | 3                   | 501        | 175       | 23        | 183       | 2,158           |  |
|     |  |                  | 61      | 226       | 181          | 234             | 73        | 70           | 32         | 369        | 3                   | 492        | 172       | 23        | 169       | 2,105           |  |
|     |  |                  |         |           |              |                 |           |              |            |            |                     |            |           |           |           |                 |  |
|     | (% Compliance)   |                  | 99.56   | 94.76     | 98.73        | 97.33           | 98.59     | 100.00       | 97.36      | 100.00     | 98.20               | 98.29      | 100.00    | 92.35     | 97.54     |                 |  |
|     | 5c. Time interval between successive rendering of bill(s)  |                  |         |           |              |                 |           |              |            |            |                     |            |           |           |           |                 |  |
|     | Total no. of customers (OPC)   | 1 month          | 898,850 | 3,568,540 | 7,028,265    | 4,836,680       | 5,247,117 | 12,422,353   | 3,716,187  | 19,349,928 | 559,334             | 13,543,473 | 9,758,430 | 7,369,870 | 4,884,444 | 93,183,471      |  |
|     | Total no. of billed customers  |                  | 898,849 | 3,568,531 | 7,028,243    | 4,836,645       | 5,246,968 | 12,422,264   | 3,716,184  | 19,347,257 | 559,307             | 13,542,605 | 9,758,420 | 7,367,642 | 4,884,437 | 93,177,352      |  |
|     | (% Compliance)   |                  | 100.00  | 100.00    | 100.00       | 100.00          | 100.00    | 100.00       | 100.00     | 99.99      | 100.00              | 99.99      | 100.00    | 99.97     | 100.00    | 99.99           |  |
|     | Average 12 month (% Compliance)  |                  | 99.12   | 98.28     | 98.15        | 97.47           | 97.21     | 97.01        | 96.99      | 96.55      | 96.50               | 96.41      | 96.38     | 95.57     | 93.32     | 97.19           |  |
|     | Average 12 month (% Compliance)  |                  |         |           |              |                 |           |              | 97.19      |            |                     |            |           |           |           |                 |  |

Sumber | Source: Tenaga Nasional Berhad

## Prestasi Perkhidmatan NUR Distribution

### NUR Distribution Service Performance

| Details  | 2008 | 2009  | 2010  | 2011   | 2012  |
|--|------|-------|-------|--------|-------|
| <b>1. Connection of Electricity Supply</b>   |      |       |       |        |       |
| <b>A. Change of Consumers</b>  |      |       |       |        |       |
| • No. of applications  | 21   | 6     | 13    | 63     | 47    |
| • Percentage of connection within 1 working day after an appointment for connection    | 100% | 100%  | 100%  | 100%   | 100%  |
| <b>B. New Supply (Low Voltage)</b>   |      |       |       |        |       |
| <b>i. Individual Applications Under Normal Conditions</b>                              |      |       |       |        |       |
| • No. of applications  | 144  | 120   | 594   | 207    | 162   |
| • Percentage of connection within 1 working day after an appointment for connection    | 100% | 100%  | 100%  | 100%   | 100%  |
| <b>ii. Bulk Supply Application And Housing Schemes</b>                                 |      |       |       |        |       |
| • No. of applications  | 0    | 0     | 0     | 0      | 0     |
| • Percentage of connection within 1 week after an appointment for connection           | n/a  | n/a   | n/a   | n/a    | n/a   |
| <b>2. Supply Restoration After Breakdowns</b>  |      |       |       |        |       |
| <b>i. Reports</b>  |      |       |       |        |       |
| • No. of reports   | 0    | 0     | 0     | 0      | 0     |
| • Percentage of consumers being given report numbers                                   | n/a  | n/a   | n/a   | n/a    | n/a   |
| <b>ii. Minor Breakdowns</b>  |      |       |       |        |       |
| • No. of minor breakdowns  | 20   | 13    | 33    | 40     | 11    |
| • Percentage of breakdown rectified within 2 hours                                     | 100% | 86.7% | 93.9% | 80.0%  | 72.7% |
| <b>iii. Major/Extra Ordinary Breakdowns</b>  |      |       |       |        |       |
| • No. of major breakdowns  | 15   | 15    | 20    | 41     | 42    |
| • Percentage of restoration within 24 hours  | 100% | 100%  | 85%   | 95.12% | 97.6  |
| <b>3. Supply Reconnection After Disconnection</b>                                      |      |       |       |        |       |
| • No. of supply disconnections   | 92   | 85    | 33    | 122    | 181   |
| • No. of consumer bills paid before 1:00 p.m. on disconnection day                     | 92   | 85    | 33    | 122    | 181   |
| • Percentage of supply reconnection on the same day or bills paid before 1:00 p.m.     | 100% | 100%  | 100%  | 100%   | 100%  |
| <b>4. Supply Interruptions Which Are Planned / Scheduled</b>                           |      |       |       |        |       |
| • No. of scheduled interruptions   | 32   | 40    | 46    | 79     | 77    |
| • Percentage of consumers given 7 days notice before scheduled interruptions           | 88%  | 95%   | 91.3% | 91.1%  | 98.7% |
| <b>5. Meter Reading</b>  |      |       |       |        |       |
| • No. of consumers with estimated readings exceeding 2 consecutive months              | 59   | 32    | 73    | 23     | 46    |
| • Notice given to customers with estimated readings exceeding 2 consecutive months (%) | 100% | 100%  | 100%  | 100%   | 100%  |
| <b>6. Enquiries / Written Complaints From Consumers</b>                                |      |       |       |        |       |
| <b>i. Written Enquiries Including Question Regarding Accounts/Bills</b>                |      |       |       |        |       |
| • No. of written complaints received   | 61   | 115   | 93    | 84     | 82    |
| • Percentage of reply within 5 working days  | 100% | 100%  | 100%  | 100%   | 100%  |

| Details   | 2008 | 2009 | 2010  | 2011 | 2012 |
|---|------|------|-------|------|------|
| <b>7. Service Counter</b>   |      |      |       |      |      |
| • Percentage of consumers that the waiting time should not exceed 20 minutes  | n/a  | n/a  | n/a   | n/a  | n/a  |
| <b>8. Appointment for Meter Accuracy Check</b>  |      |      |       |      |      |
| • No. of appointments for meter accuracy check  | 14   | 5    | 8     | 6    | 1    |
| • Percentage of meter accuracy check carried out within 1 working day   | 100% | 100% | 100%  | 100% | 100% |
| <b>9. Meter Replacement</b>   |      |      |       |      |      |
| • No. of meter replacement  | 9    | 5    | 3     | 9    | 12   |
| • Percentage of meter replacement within 2 working days   | 100% | 100% | 100%  | 100% | 100% |
| <b>10. Appointment With Consumers</b>   |      |      |       |      |      |
| <b>i. For Appointments Outside NUR Premises</b>   |      |      |       |      |      |
| • No. of appointments where NUR officers arrived not later than 15 minutes from the agreed time   | 316  | 184  | 648   | 276  | 265  |
| <b>ii. Postponement by NUR</b>  |      |      |       |      |      |
| • Percentage of subsequent appointment made within 1 working day  | 100% | 100% | 98.5% | 100% | 100% |
| <b>11. Deposits</b>   |      |      |       |      |      |
| • No. of consumers found after 6 months that their deposits exceed average consumption of 2 months  | 0    | 0    | 0     | 0    | 0    |
| • Percentage of consumers who have the excess deposits returned   | n/a  | n/a  | n/a   | n/a  | n/a  |
| <b>12. Refund of Consumer Deposits</b>  |      |      |       |      |      |
| • No. of consumers who have forwarded all required documents for refund of deposits   | 81   | 124  | 102   | 111  | 121  |
| • Percentage of consumers who have their deposits refunded within 15 working days   | 100% | 100% | 100%  | 100% | 100% |
| <b>13. Collection</b>   |      |      |       |      |      |
| • Percentage of proof of payment sent to payment via mail within 5 working days   | 100% | 100% | 100%  | 100% | 100% |
| <b>14. Supply Disconnection</b>   |      |      |       |      |      |
| <b>i. With 24 hours Notice</b>  |      |      |       |      |      |
| • No. of disconnections due to dangerous consumer installations   | 0    | 0    | 0     | 0    | 0    |
| • No. of disconnections due to suspicion of theft of electricity  | 0    | 0    | 0     | 0    | 0    |
| • No. of disconnections due to electricity meter being damaged  | 0    | 0    | 0     | 0    | 0    |
| <b>ii. Without Any Notice</b>   |      |      |       |      |      |
| • No. of disconnections due to failure to pay bills within 15 days after issuance of bill   | 0    | 0    | 0     | 0    | 0    |
| • No. of disconnections due to failure to pay additional deposits within 7 days from the date of notice   | 94   | 86   | 45    | 142  | 145  |
| • No. of disconnections of installations which are dangerous  | 0    | 0    | 0     | 9    | 0    |
| <b>15. Special Consumers Who Face Problems in Paying Electric Bills</b>   |      |      |       |      |      |
| • No of handicapped and senior consumers who face problems in paying electric bills, and having special arrangements provided by NUR to collect from them | 0    | 0    | 0     | 0    | 0    |

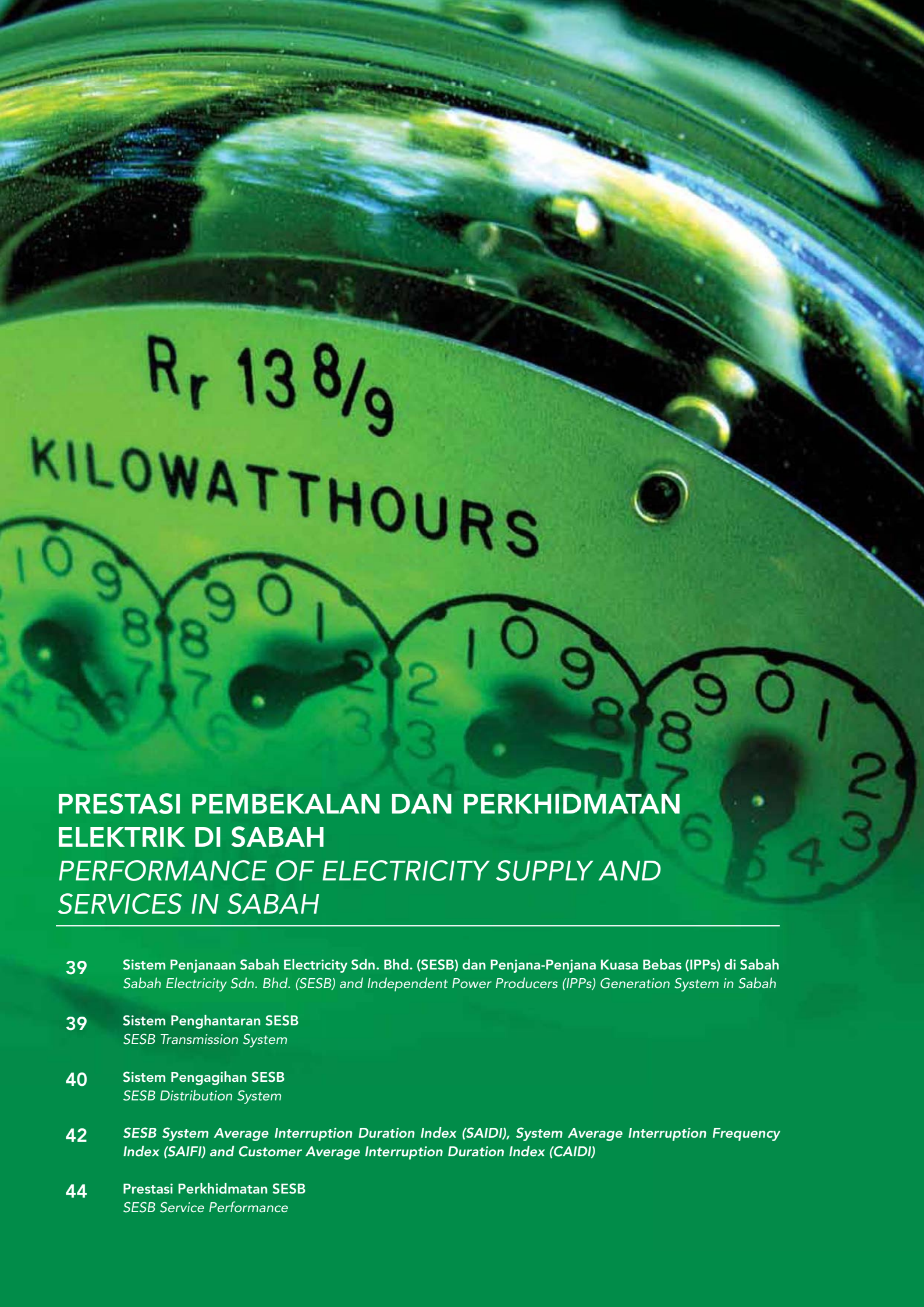
| Details   | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|
| <b>16. Voltage Outside Standard</b>   |      |      |      |      |      |
| <b>i. No Enhancement Work on Network is Required</b>  |      |      |      |      |      |
| • No. of complaints   | 1    | 6    | 3    | 10   | 5    |
| • Percentage of complaints settled within 2 days from the date of complaint   | 100% | 100% | 100% | 100% | 100% |
| <b>ii. Network Enhancement Work is Required</b>   |      |      |      |      |      |
| • No. of complaints   | 0    | 0    | 0    | 0    | 0    |
| • Percentage of complaints settled within 6 months from the date of complaint   | n/a  | n/a  | n/a  | n/a  | n/a  |
| <b>17. New / Increase of Supply Application Reply</b>   |      |      |      |      |      |
| <b>i. No New Substation Required</b>  |      |      |      |      |      |
| • No. of applications   | 10   | 3    | 7    | 12   | 12   |
| • Percentage of applications being replied within 1 weeks from the date of application  | 100% | 100% | 100% | 100% | 100% |
| <b>ii. New Substation Required</b>  |      |      |      |      |      |
| • No. of applications   | 3    | 2    | 0    | 4    | 0    |
| • Percentage of applications being replied within 2 weeks from the date of application  | 100% | 100% | n/a  | 100% | n/a  |
| <b>18. Transferring of Meter Location Upon Consumer Request</b>   |      |      |      |      |      |
| • No. of applications for transferring of meter location upon consumer which was felt as necessary and applicable                                       | 9    | 2    | 7    | 8    | 14   |
| • Percentage of applications which was necessary and being felt an applicable was settled within 7 working days   | 100% | 100% | 100% | 100% | 100% |
| <b>19. Education of Energy Efficiency</b>   |      |      |      |      |      |
| • No. of consumers education programmes on energy efficiency and electricity accident, including the activities near installation and electricity lines | 4    | 4    | 4    | 4    | 4    |
| <b>20. Power Quality Improvement</b>  |      |      |      |      |      |
| • No. of activities to improve power quality  | 49   | 66   | 49   | 61   | 56   |

Nota | Note:

n/a Tiada Maklumat | Not Available

Sumber | Source : NUR Distribution Sdn. Bhd.





## **PRESTASI PEMBEKALAN DAN PERKHIDMATAN ELEKTRIK DI SABAH** *PERFORMANCE OF ELECTRICITY SUPPLY AND SERVICES IN SABAH*

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- 39** **Sistem Penjanaan Sabah Electricity Sdn. Bhd. (SESB) dan Penjana-Penjana Kuasa Bebas (IPPs) di Sabah**  
*Sabah Electricity Sdn. Bhd. (SESB) and Independent Power Producers (IPPs) Generation System in Sabah*
- 39** **Sistem Penghantaran SESB**  
*SESB Transmission System*
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*SESB Service Performance*



## Sistem Penjanaan Sabah Electricity Sdn. Bhd. (SESB) dan Penjana-Penjana Kuasa Bebas (IPPs) di Sabah

Sabah Electricity Sdn. Bhd. (SESB) and Independent Power Producers (IPPs) Generation System in Sabah

### Jadual 1: Purata Kecekapan Thermal (%), Faktor Kesediaan Setara (EAF) (%) dan Faktor Henti Tugas Tidak Berjadual Setara (EUOF) (%)

Table 1: Average Thermal Efficiency (%), Equivalent Availability Factor (EAF) (%) and Equivalent Unplanned Outage Factor (EUOF) (%)

| Jenis Loji<br>Plant Type     | Purata Kecekapan Thermal<br>Average Thermal Efficiency (%) |       |       |       | EAF (%) |       |       |       | EUOF (%) |       |       |       |
|------------------------------|--|-------|-------|-------|---------|-------|-------|-------|----------|-------|-------|-------|
|                              | 2011   |       | 2012  |       | 2011    |       | 2012  |       | 2011     |       | 2012  |       |
|                              | SESB   | IPP   | SESB  | IPP   | SESB    | IPP   | SESB  | IPP   | SESB     | IPP   | SESB  | IPP   |
| Kitar Padu<br>Combined Cycle | 24.90  | 38.05 | 26.73 | 38.72 | 70.91   | 95.19 | 73.43 | 93.92 | 11.49    | 3.31  | 6.59  | 1.88  |
| Disel I Diesel               | 29.06  | 38.69 | 27.72 | 38.20 | 58.53   | 71.72 | 60.76 | 74.57 | 30.79    | 27.06 | 20.77 | 23.66 |
| Hidro I Hydro                | -  | -     | -     | -     | 90.68   | -     | 86.23 | -     | 0.94     | -     | 10.34 | -     |

## Sistem Penghantaran SESB

SESB Transmission System

### Jadual 2: Pelantikan Bulanan bagi Sistem Penghantaran dengan Kehilangan Beban sebanyak 50 MW ke Atas

Table 2: Monthly Trippings of Transmission System with Load Loss of Above 50 MW

| Petunjuk   Indicator   | Jan<br>Jan | Feb<br>Feb | Mac<br>Mar | Apr<br>Apr | Mei<br>May | Jun<br>June | Jul<br>Jul | Ogos<br>Aug | Sept<br>Sept | Okt<br>Oct | Nov<br>Nov | Dis<br>Dec |
|--|------------|------------|------------|------------|------------|-------------|------------|-------------|--------------|------------|------------|------------|
| Bilangan Pelantikan Tanpa Lucutan Beban<br>Number of Trippings Without Load Shedding                       | 1          | 0          | 1          | 1          | 1          | 1           | 0          | 0           | 0            | 0          | 0          | 0          |
| Bilangan Pelantikan Dengan Lucutan Beban<br>Number of Trippings With Load Shedding                         | 0          | 0          | 0          | 0          | 0          | 0           | 0          | 0           | 0            | 0          | 0          | 0          |
| Kehilangan Beban Maksimum (MW)<br>Maximum Load Losses (MW)   | 59.06      | -          | 86.01      | 475        | 89.56      | 69.03       | -          | -           | -            | -          | -          | -          |
| Tenaga Yang Tidak Dibekalkan Semasa Pelantikan (MWj)<br>Unsupplied Energy During Trippings (MWh)           | 186.56     | -          | 173.34     | 2,722.53   | 341.10     | 73.50       | -          | -           | -            | -          | -          | -          |
| Purata Tenaga Tidak Dibekalkan Setiap Pelantikan (MWj)<br>Average Unsupplied Energy During Trippings (MWh) | 186.56     | -          | 173.34     | 2,722.53   | 341.10     | 73.50       | -          | -           | -            | -          | -          | -          |
| Purata Tempoh Setiap Pelantikan (Jam: Minit)<br>Average Duration Per Tripping (Hour: Minutes)              | 4:58       | -          | 3:38       | 14:56      | 6:32       | 1:46        | -          | -           | -            | -          | -          | -          |
| Tenaga Tidak Dibekalkan Semasa Lucutan Beban (MWj)<br>Unsupplied Energy During Load Shedding (MWh)         | 0          | -          | 0          | 0          | 0          | 0           | -          | -           | -            | -          | -          | -          |

**Jadual 3: Delivery Point Unreliability Index (DePUI) - System Minutes SESB**

Table 3: Delivery Point Unreliability Index (DePUI) - System Minutes SESB

| Tahun   Year  | 2008   | 2009  | 2010  | 2011  | 2012    |
|---|--------|-------|-------|-------|---------|
| Termasuk Bekalan Elektrik Terputus<br><i>Including Blackout</i>       | 154.38 | -     | -     | -     | 263.91* |
| Tidak Termasuk Bekalan Elektrik Terputus<br><i>Excluding Blackout</i> | 11.89  | 31.58 | 20.21 | 40.13 | 67.12   |

Nota | Note:

\* Termasuk 5 insiden besar | Including 5 major incidents

Tahun Kewangan 2011/12 | Financial Year 2011/12

**Jadual 4: Insiden Pelantikan bagi Talian/Kabel per 100 cct-km mengikut Tahap Voltan**

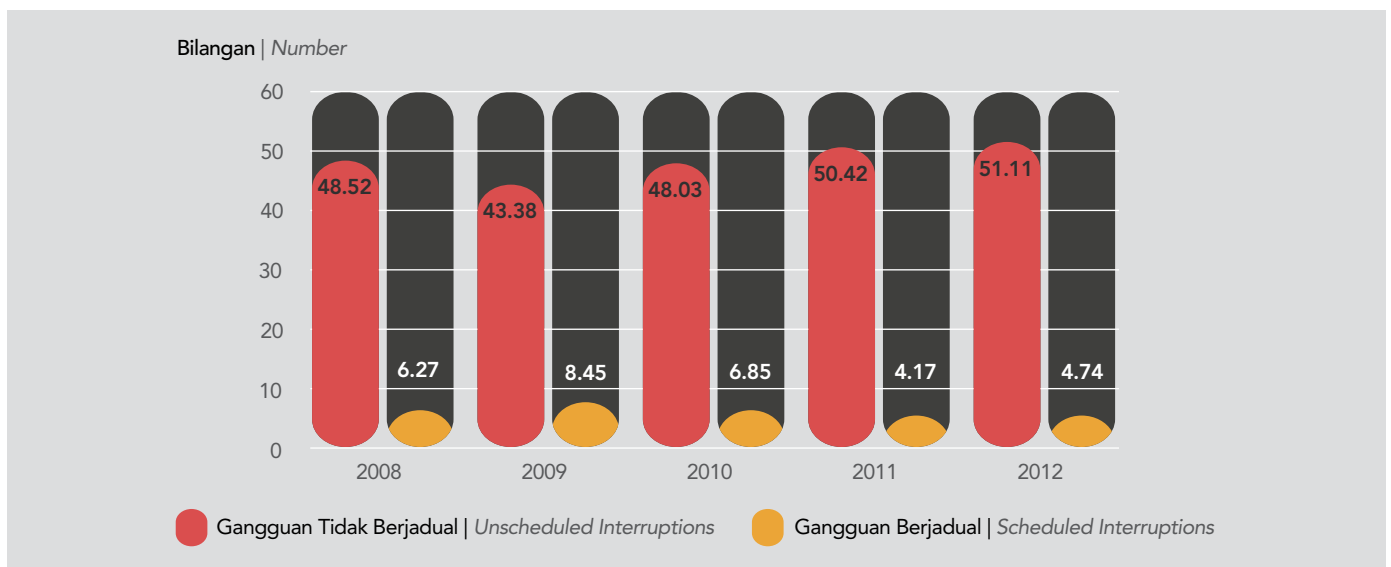
Table 4: Lines/Cables Tripping Incidents per 100 cct-km by Voltage Level

| Tahap Voltan   Voltage Level | 2008 | 2009 | 2010  | 2011 | 2012 |
|------------------------------|------|------|-------|------|------|
| 275kV                        | -    | 0.2  | 0.2   | 0.2  | 0    |
| 132kV                        | 0.28 | 0.44 | 0.12  | 0.42 | 1.08 |
| 66kV                         | 5.51 | 4.34 | 16.34 | 6.68 | 5.56 |

Tahun Kewangan 2011/12 | Financial Year 2011/12

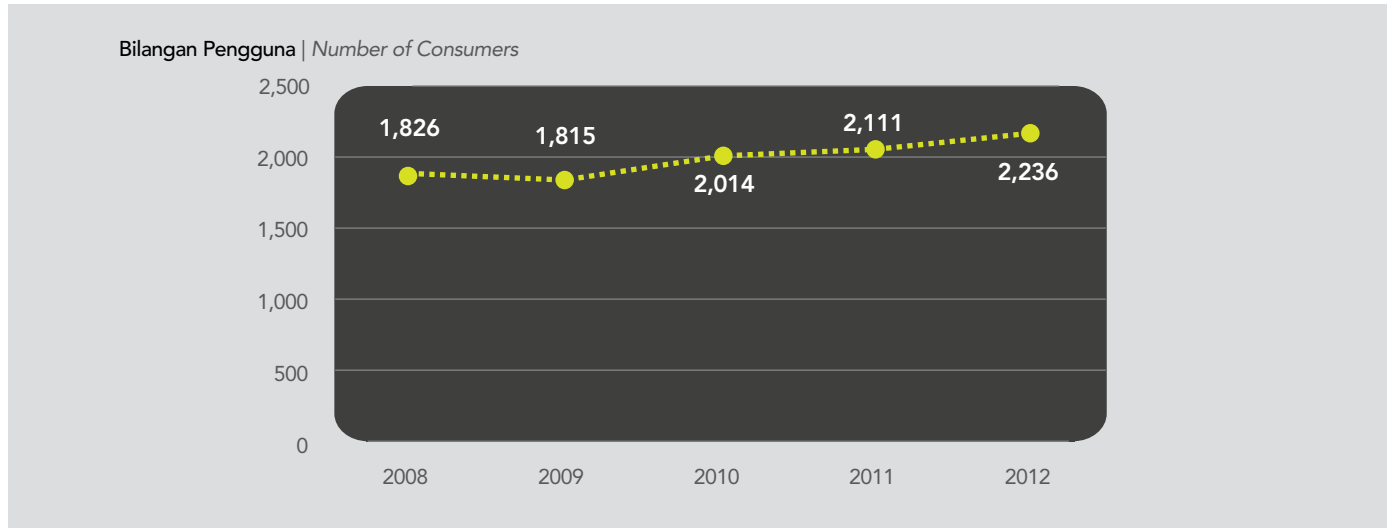
**Sistem Pengagihan SESB***SESB Distribution System***Carta 1: Gangguan Bekalan Elektrik per 1,000 Pengguna**

Chart 1: Electricity Supply Interruptions per 1,000 Consumers



Nota | Note :

Tidak termasuk gangguan pada sistem penjanaan dan penghantaran | Excluding the interruptions at generation and transmission system

**Carta 2: Purata Bulanan Gangguan Bekalan Elektrik***Chart 2: Monthly Average Electricity Supply Interruptions*

Nota | Note :

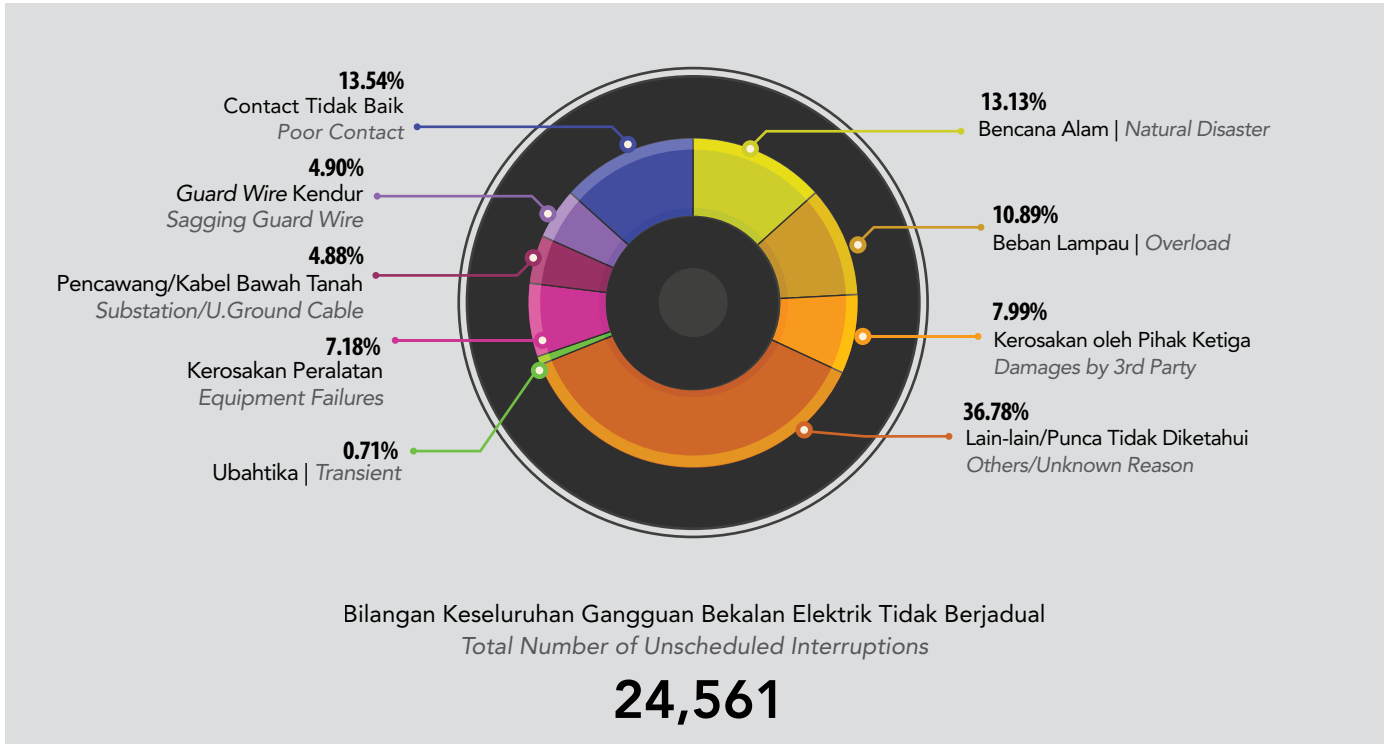
Tidak termasuk gangguan pada sistem penjanaan dan penghantaran | *Excluding the interruptions at generation and transmission system***Jadual 5: Bilangan Gangguan Bekalan Elektrik***Table 5: Number of Electricity Supply Interruptions*

| Bilangan   Number   | 2008   | 2009   | 2010   | 2011   | 2012   |
|---|--------|--------|--------|--------|--------|
| Gangguan Tidak Berjadual   <i>Unscheduled Interruptions</i> | 19,484 | 18,228 | 21,157 | 23,397 | 24,561 |
| Gangguan Berjadual   <i>Scheduled Interruptions</i>         | 2,427  | 3,550  | 3,016  | 1,937  | 2,280  |
| Jumlah Gangguan   <i>Total Interruptions</i>                | 21,911 | 21,778 | 24,173 | 25,334 | 26,841 |

Nota | Note:

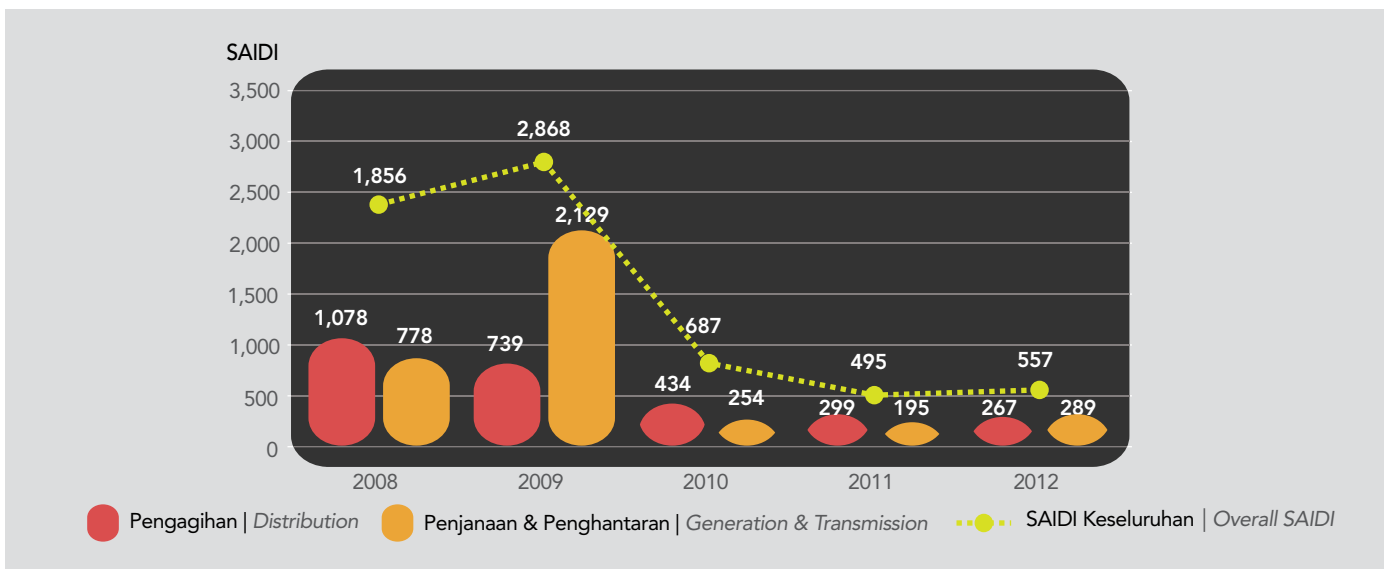
Tidak termasuk gangguan pada sistem penjanaan dan penghantaran | *Excluding interruptions at generation and transmission systems*

**Carta 3: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan**  
 Chart 3: Percentage of Unscheduled Supply Interruption by Type of Interruptions

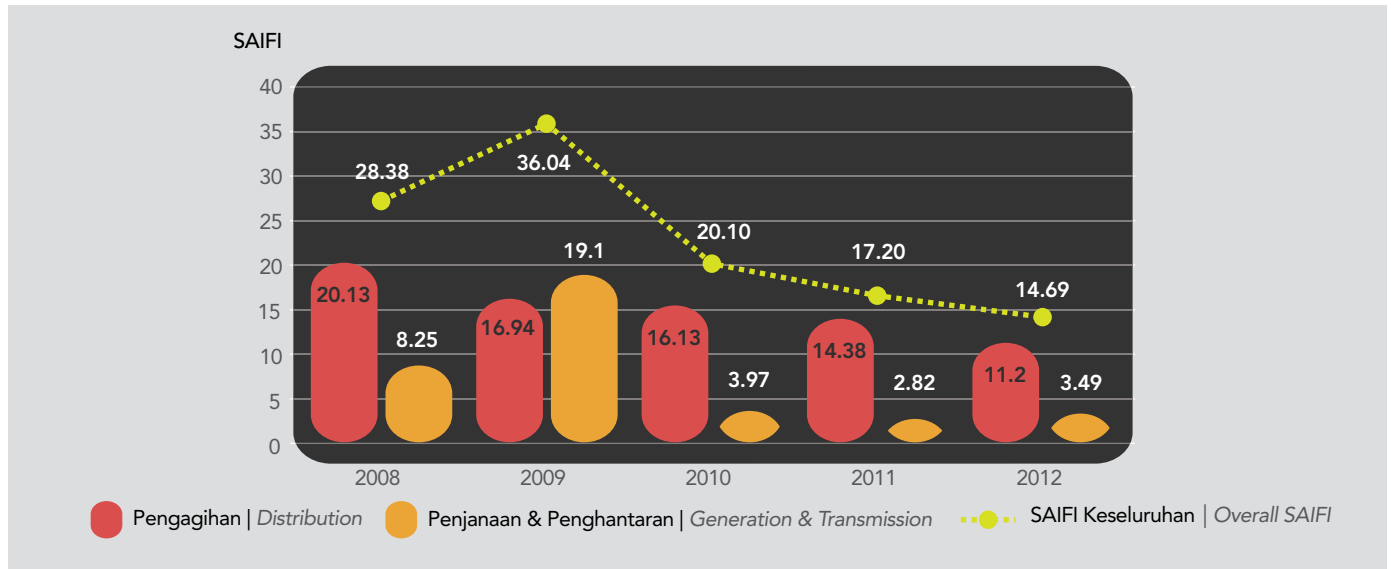


**SESB System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI)**

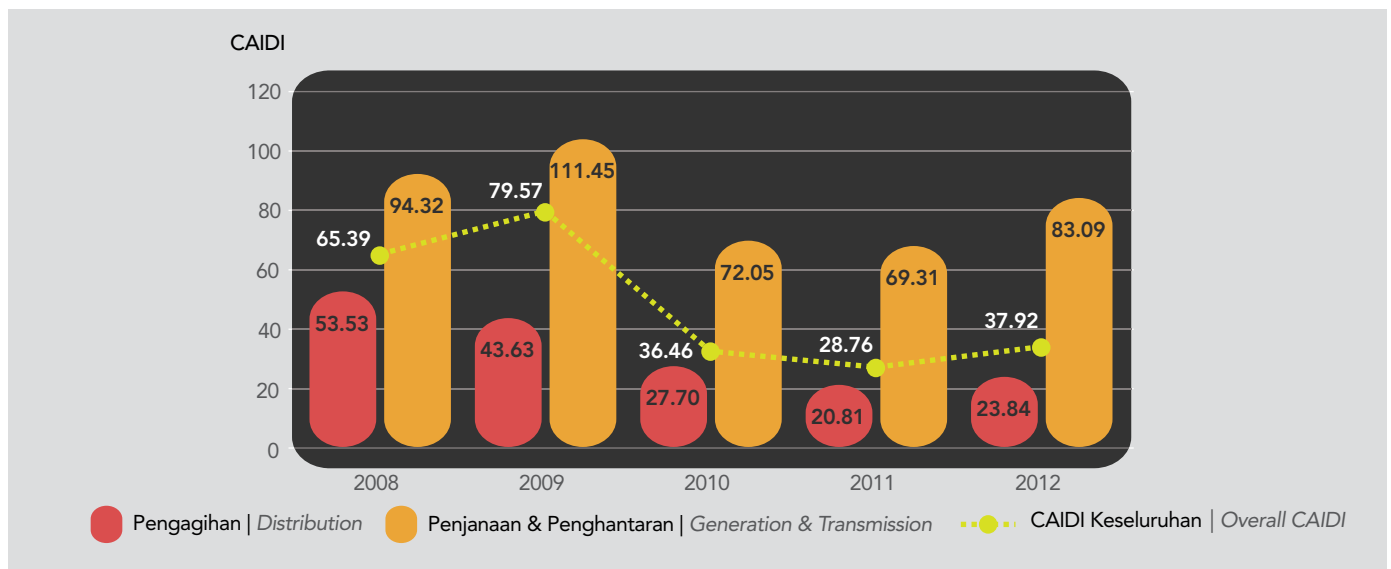
**Carta 4: SAIDI (Minit/Pelanggan/Tahun)**  
 Chart 4: SAIDI (Minutes/Customer/Year)



**Carta 5: SAIFI (Bilangan Gangguan/Pelanggan/Year)**  
 Chart 5: SAIFI (Number of Interruptions/Customer/Year)



**Carta 6: CAIDI (Minit/Pelanggan Terlibat/Tahun)**  
 Chart 6: CAIDI (Minutes/Involved Customer/Year)



## Prestasi Perkhidmatan SESB

### SESB Service Performance

| Details  | 2008    | 2009    | 2010    | 2011    | 2012    |
|--|---------|---------|---------|---------|---------|
| <b>1. Connection of Electricity Supply</b>   |         |         |         |         |         |
| <b>A. Change of Consumers</b>  |         |         |         |         |         |
| • No. of applications  | 7,638   | 6,893   | 7,600   | 12,209  | 8,725   |
| • Percentage of connection within 1 working day after an appointment for connection                              | 90.0%   | 79.0%   | 80.9%   | 92.0%   | 95.8%   |
| <b>B. New Supply (Low Voltage)</b>   |         |         |         |         |         |
| <b>i. Individual Applications Under Normal Conditions</b>  | 11,741  | 12,491  | 15,742  | 17,000  | 19,385  |
| • No. of applications  | 68.6%   | 62.4%   | 67.6%   | 70.0%   | 89.6%   |
| • Percentage of connection within 2 working days after an appointment for connection                             |         |         |         |         |         |
| <b>ii. Bulk Supply Application And Housing Schemes</b>   |         |         |         |         |         |
| • No. of applications  | 6,352   | 6,340   | 6,645   | 5,493   | 4,850   |
| • Percentage of connection within 2 weeks after an appointment for connection                                    | 89.9%   | 96.7%   | 91.6%   | 94.6%   | 97.0%   |
| <b>2. Supply Restoration After Breakdowns</b>  |         |         |         |         |         |
| <b>i. Complaints</b>   | 248,957 | 190,251 | 209,508 | 55,638  | 76,664  |
| • No. of complaints  | 2,819   | 3,775   | 5,897   | 52,856  | 66,455  |
| • No. of consumers where the information not available at that time was contacted again within 15 minutes        |         |         |         |         |         |
| • Percentage of consumers being given complaint numbers  | 95.0%   | 95.0%   | 95.5%   | 37.85%  | 98.0%   |
| • Percentage of consumers where the information not available at that time was contacted again within 15 minutes | 1.13%   | 1.9%    | 2.8%    | 95.0%   | 86.7%   |
| <b>ii. Minor Breakdowns</b>  |         |         |         |         |         |
| • No. of minor breakdowns  | 20,268  | 17,981  | 19,513  | 19,547  | 22,415  |
| • Percentage of breakdown rectified within 2 hours   | 92.8%   | 93.0%   | 99.0%   | 95.0%   | 91.3%   |
| <b>iii. Major/Extra Ordinary Breakdowns</b>  |         |         |         |         |         |
| • No. of major breakdowns  | 404     | 618     | 452     | 2,743   | 3,406   |
| • Percentage of restoration within 12 hours  | 96.5%   | 95.9%   | 97.1%   | 97.01%  | 85.5%   |
| <b>3. Supply Reconnection After Disconnection</b>  |         |         |         |         |         |
| • No. of supply disconnections   | 86,317  | 80,142  | 89,166  | 127,786 | 124,745 |
| • Bills paid before 1.00 p.m. on disconnection day   | 60,421  | 48,330  | 52,393  | 70,865  | 115,770 |
| • Percentage of supply reconnection on the same day for bills paid before 1.00 p.m.                              | 70.0%   | 60.3%   | 58.8%   | 55.46%  | 92.8%   |
| <b>4. Supply Interruptions Which Are Planned / Scheduled</b>   |         |         |         |         |         |
| <b>i. Scheduled Interruptions</b>  |         |         |         |         |         |
| • No. of scheduled interruptions   | 3,020   | 4,980   | 5,020   | 504     | 601     |
| • Percentage of consumers being given notice within 7 days before interruptions                                  | 70.0%   | 71.0%   | 81.8%   | 80.0%   | 92.3%   |
| <b>ii. Planning of Scheduled Interruptions</b>   |         |         |         |         |         |
| • No. of yearly and monthly planning of scheduled interruptions  | 332     | 337     | 339     | 231     | 157     |
| • No. of affected consumers  | 78,625  | 6,579   | 73,901  | 3,421   | 3,462   |
| • Percentage of affected consumers informed about the planning of scheduled interruptions                        | 93.8%   | 99.7%   | 99.9%   | 94.01%  | 97.0%   |
| <b>5. Meter Reading</b>  |         |         |         |         |         |
| • No. of consumers with estimated readings exceeding 3 consecutive months  | 6,762   | 5,177   | 6,843   | 33,335  | 14,211  |
| • Percentage of notice given to consumers with estimated readings exceeding 3 consecutive months                 | 50.0%   | 50.9%   | 58.4%   | 55.0%   | 95.9%   |



| Details  | 2008    | 2009    | 2010    | 2011    | 2012    |
|--|---------|---------|---------|---------|---------|
| <b>6. Enquiries / Written Complaints From Consumers</b>  |         |         |         |         |         |
| <b>i. Written Enquiries</b>  |         |         |         |         |         |
| • No. of written enquiries received  | 2,695   | 598     | 708     | 432     | 485     |
| • Percentage of reply within 5 working days  | 80.0%   | 71.7%   | 83.3%   | 81.94%  | 96.9%   |
| <b>ii. Enquiries Through Telephone</b>   |         |         |         |         |         |
| • No. of unresolved complaints made through telephone  | 22,572  | 27,296  | 19,936  | 24,488  | 26,522  |
| • No. of consumers with unresolved complaints recontacted within 24 hours                          | 1,598   | 2,297   | 2,744   | 3,791   | 25,545  |
| • Percentage of consumers with unresolved complaints recontacted within 24 hours                   | 7.1%    | 8.4%    | 13.8%   | 15.48%  | 96.3%   |
| <b>iii. Enquiries in Counter</b>   |         |         |         |         |         |
| • No. of unresolved complaints made at counter   | 43,085  | 59,538  | 41,769  | 52,324  | 51,209  |
| • No. of consumers with unresolved complaints recontacted within 24 hours                          | 5,009   | 3,565   | 2,821   | 7,220   | 38,123  |
| • Percentage of consumers with unresolved complaints recontacted within 24 hours                   | 11.6%   | 5.9%    | 6.8%    | 13.80%  | 74.5%   |
| <b>7. Service Counter</b>  |         |         |         |         |         |
| • No. of consumers who were getting services at the counter  | 268,142 | 246,343 | 200,888 | 278,940 | 313,942 |
| • Percentage of consumers with waiting time not exceeding 15 minutes                               | 75.0%   | 60.4%   | 53.5%   | 52.76%  | 95.9%   |
| <b>8. Appointment for Meter Accuracy Check</b>   |         |         |         |         |         |
| • No. of appointments for meter accuracy check   | 1,425   | 1,388   | 1,726   | 1,502   | 1,344   |
| • Percentage of meter accuracy check carried out within 2 working day                              | 45.9%   | 44.8%   | 45.0%   | 78.03%  | 92.3%   |
| <b>9. Meter Replacement</b>  |         |         |         |         |         |
| • No. of meter replacements  | 6,446   | 7,006   | 8,731   | 8,997   | 11,266  |
| • Percentage of meter replacements within 2 working days from the date of application made         | 51.9%   | 52.0%   | 56.1%   | 61.35%  | 93.6%   |
| <b>10. Appointment With Consumers</b>  |         |         |         |         |         |
| <b>i. For Appointments Outside SESB Premises</b>   |         |         |         |         |         |
| • Appointments where SESB officers arrived not later than the agreed time                          | 90.5%   | 88.8%   | 84.1%   | 89.73%  | 93.1%   |
| <b>ii. Postponement by SESB</b>  |         |         |         |         |         |
| • Percentage of subsequent appointment made within 1 working day                                   | 61.5%   | 67.6%   | 78.3%   | 71.15%  | 93.2%   |
| <b>11. Deposits</b>  |         |         |         |         |         |
| • No. of consumers found after 6 months that their deposits exceed average consumption of 2 months | 11,515  | 18,529  | 20,206  | 12,269  | 2,790   |
| • Percentage of consumers who have the excess deposits returned                                    | 11.0%   | 2.6%    | 10.5%   | 10.9%   | 82.7%   |
| <b>12. Refund of Consumer Deposits</b>   |         |         |         |         |         |
| • No. of consumers who have forwarded all required documents for refund of deposits                | 7,675   | 5,246   | 7,738   | 8,258   | 9,685   |
| • Percentage of consumers who have their deposits refunded within 1 month                          | 80.0%   | 96.5%   | 84.5%   | 85.0%   | 91.9%   |
| <b>13. Collection</b>  |         |         |         |         |         |
| • Percentage of proof of payment sent via mail within 2 working days                               | 93.0%   | 93.6%   | 93.9%   | 95.0%   | 99.2%   |

| Details  | 2008   | 2009   | 2010   | 2011   | 2012   |
|--|--------|--------|--------|--------|--------|
| <b>14. Supply Disconnection</b>  |        |        |        |        |        |
| <b>i. With 24 Hours Notice</b>   |        |        |        |        |        |
| • No. of disconnections due to unsafe consumer installations   | 613    | 38     | 30     | 32     | 102    |
| • No. of disconnections due to suspicion of electricity theft  | 90     | 54     | 22     | 102    | 138    |
| • No. of disconnections due to electricity meter being tampered  | 19     | 32     | 15     | 1      | 16     |
| <b>ii. With More Than 24 Hours Notice</b>  |        |        |        |        |        |
| • No. of disconnections due to failure to pay the bills within 30 days after issuance of bill and 7 days from the notice of disconnections | 28,578 | 40,189 | 58,915 | 50,028 | 51,535 |
| • Notice of disconnections due to failure to pay additional deposits within 7 days from notice date  | 115    | 254    | 134    | 86     | 0      |
| <b>iii. Without Any Notice</b>   |        |        |        |        |        |
| • No. of disconnections due to unsafe installations  | 258    | 1,003  | 1,353  | 258    | 930    |
| <b>15. Special Group of Consumers Facing Difficulties In Order To Pay Electric Bills</b>   |        |        |        |        |        |
| • No. of handicapped consumers who appealed to avoid disconnections  | 0      | 0      | 7      | 1      | 6      |
| • No. of senior consumers who appealed to avoid disconnections   | 12     | 41     | 34     | 10     | 24     |
| • No. of handicapped consumers who were assisted in the payment of bills   | 25     | 30     | 23     | 5      | 21     |
| • No. of senior consumers who were assisted in the payment of bills  | 30     | 16     | 20     | 20     | 47     |
| <b>16. Voltage Incompliant With The Standards</b>  |        |        |        |        |        |
| <b>i. Not Requiring Enhancement Work on Network</b>  |        |        |        |        |        |
| • No. of complaints  | 62     | 1,130  | 78     | 33     | 35     |
| • Percentage of complaints settled within 2 days from the date of complaints   | 64.5%  | 38.9%  | 43.6%  | 100.0% | 94.3%  |
| <b>ii. Requiring Enhancement Work on Network</b>   |        |        |        |        |        |
| • No. of complaints  | 166    | 118    | 70     | 48     | 157    |
| • Percentage of complaints settled within 3 months from the date of complaints   | 98.2%  | 68.6%  | 75.7%  | 97.92% | 94.9%  |
| <b>17. Reply To New/Increase of Supply Application</b>   |        |        |        |        |        |
| <b>i. No New Substation Required</b>   |        |        |        |        |        |
| • No. of applications  | 1,897  | 2,087  | 2,274  | 3,248  | 3,084  |
| • Percentage of applications replied within 1 week from the date of application  | 72.9%  | 64.9%  | 76.2%  | 79.99% | 94.2%  |
| <b>ii. New Substation Required</b>   |        |        |        |        |        |
| • No. of applications  | 114    | 61     | 237    | 242    | 465    |
| • Percentage of applications replied within 2 week from the date of application  | 86.8%  | 90.2%  | 73.4%  | 96.69% | 99.8%  |
| <b>18. Transferring of Meter Location Upon Consumer Request</b>  |        |        |        |        |        |
| • No. of applications for meter relocation   | 11     | 88     | 16     | 33     | 61     |
| • Percentage of applications settled within 3 working days   | 68.8%  | 62.5%  | 68.8%  | 72.73% | 98.0%  |
| <b>19. Education of Energy Efficiency</b>  |        |        |        |        |        |
| • No. of education programmes on energy efficiency and safety, including activities near installations and electricity lines               | 11     | 19     | 23     | 6      | 56     |
| <b>20. Power Quality Improvement</b>   |        |        |        |        |        |
| • No. of activities to improve power quality   | 379    | 446    | 454    | 269    | 184    |





## PRESTASI PEMBEKALAN DAN PERKHIDMATAN ELEKTRIK DI SARAWAK *PERFORMANCE OF ELECTRICITY SUPPLY AND SERVICES IN SARAWAK*

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- 48** **Sistem Penghantaran Sarawak Energy Berhad (SEB)**  
*Sarawak Energy Berhad (SEB) Transmission System*
- 49** **Sistem Pengagihan SEB**  
*SEB Distribution System*
- 51** **SEB System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI)**

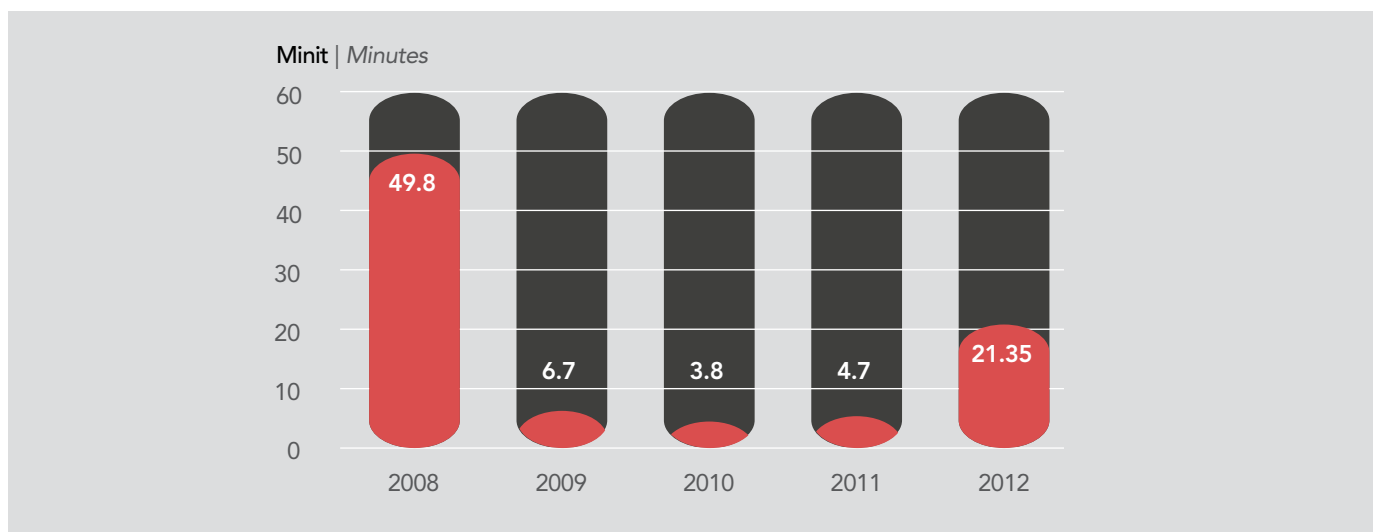
## Sistem Penghantaran Sarawak Energy Berhad (SEB)

### Sarawak Energy Berhad (SEB) Transmission System

**Jadual 1: Pelantikan Sistem Penghantaran dengan Kehilangan Beban sebanyak 50 MW ke Atas**  
 Table 1: Monthly Trippings of Transmission System with Load Loss of Above 50 MW

| Petunjuk   Indicator   | Jan<br>Jan | Feb<br>Feb | Mac<br>Mar | Apr<br>Apr | Mei<br>May | Jun<br>June | Jul<br>Jul | Ogos<br>Aug | Sept<br>Sept | Okt<br>Oct | Nov<br>Nov | Dis<br>Dec |
|--|------------|------------|------------|------------|------------|-------------|------------|-------------|--------------|------------|------------|------------|
| Bilangan Pelantikan Tanpa Lucutan Beban<br>Number of Trippings Without Load Shedding                       | 1          | 1          | 2          | 1          | 0          | 2           | 0          | 1           | 3            | 3          | 2          | 2          |
| Bilangan Pelantikan Dengan Lucutan Beban<br>Number of Trippings With Load Shedding                         | 0          | 0          | 0          | 0          | 0          | 0           | 0          | 0           | 0            | 0          | 189        | 0          |
| Kehilangan Beban Maksimum (MW)<br>Maximum Load Losses (MW)   | 14         | 4          | 140        | 4          | 0          | 9           | 0          | 12          | 68           | 15         | 244        | 11         |
| Tenaga Yang Tidak Dibekalkan Semasa Pelantikan (MWj)<br>Unsupplied Energy During Trippings (MWh)           | 3          | 1          | 274        | 5          | 0          | 2           | 0          | 12          | 94           | 21         | 555        | 8          |
| Purata Tenaga Tidak Dibekalkan Setiap Pelantikan (MWj)<br>Average Unsupplied Energy During Trippings (MWh) | 3          | 1          | 274        | 5          | 0          | 2           | 0          | 12          | 31           | 7          | 278        | 4          |
| Purata Tempoh Setiap Pelantikan (Jam: Minit)<br>Average Duration Per Tripping (Hour: Minutes)              | 12         | 22         | 172        | 80         | 0          | 30          | 0          | 60          | 77           | 86         | 417        | 48         |
| Tenaga Tidak Dibekalkan Semasa Lucutan Beban (MWj)<br>Unsupplied Energy During Load Shedding (MWh)         | 0          | 0          | 0          | 0          | 0          | 0           | 0          | 0           | 0            | 0          | 222        | 0          |

**Carta 1: Delivery Point Unreliability Index (DePUI) - System Minutes SEB**  
 Chart 1: Delivery Point Unreliability Index (DePUI) - System Minutes SEB

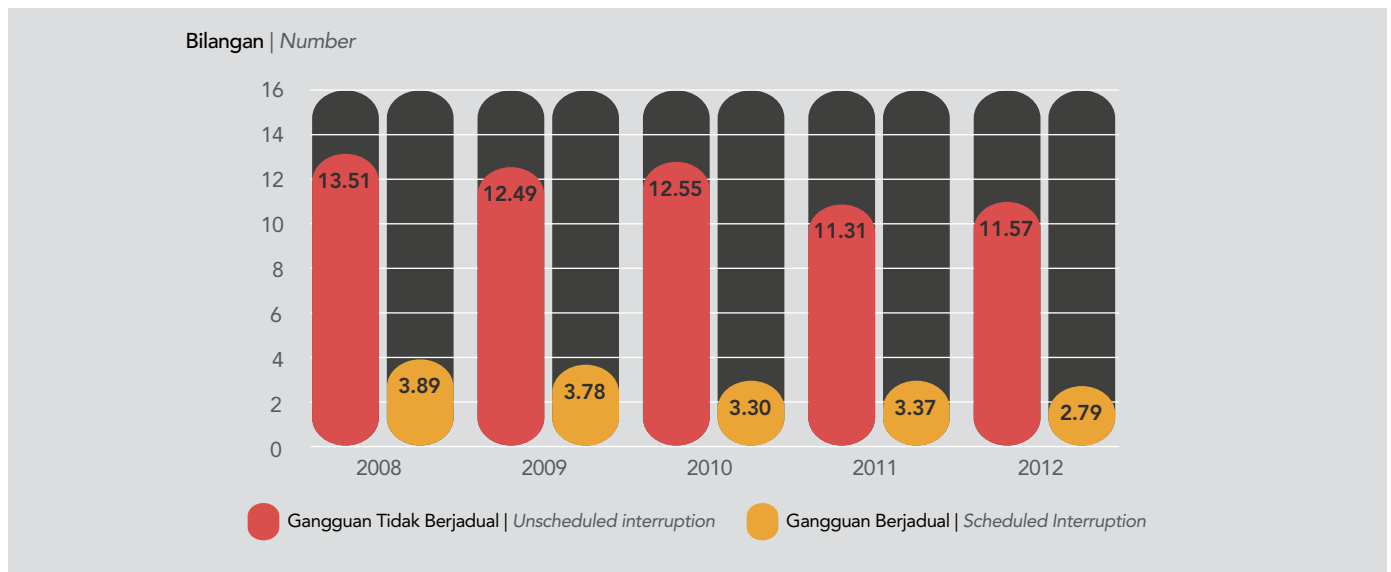


## Sistem Pengagihan SEB

### SEB Distribution System

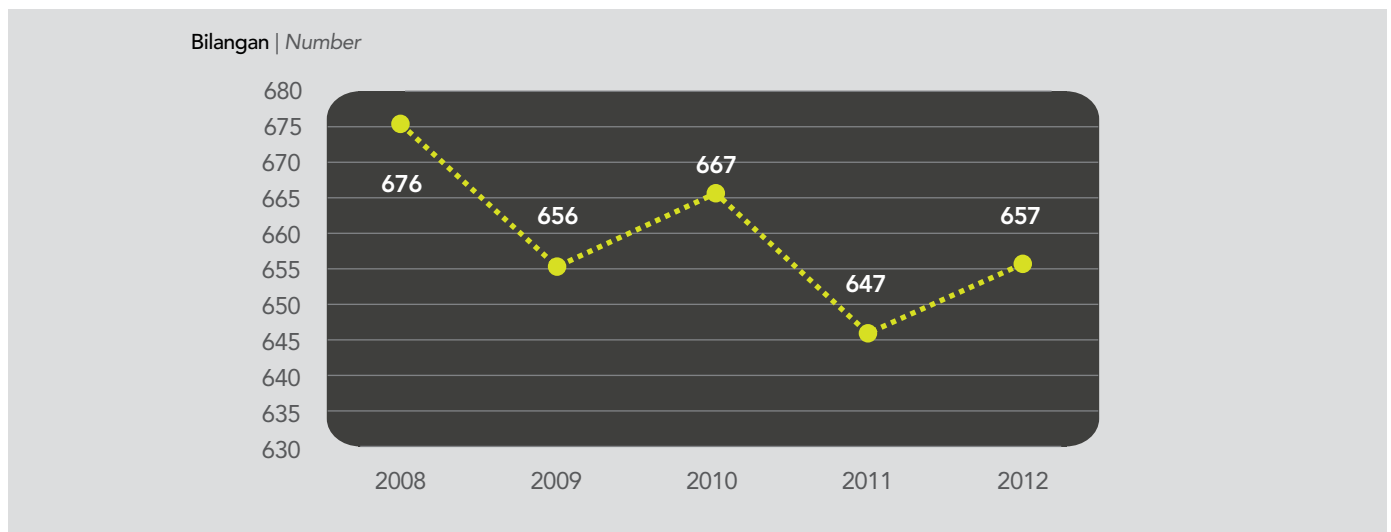
**Carta 2: Gangguan Bekalan Elektrik per 1,000 Pengguna**

Chart 2: Electricity Supply Interruptions per 1,000 Consumers



**Carta 3: Purata Gangguan Bekalan Elektrik Bulanan**

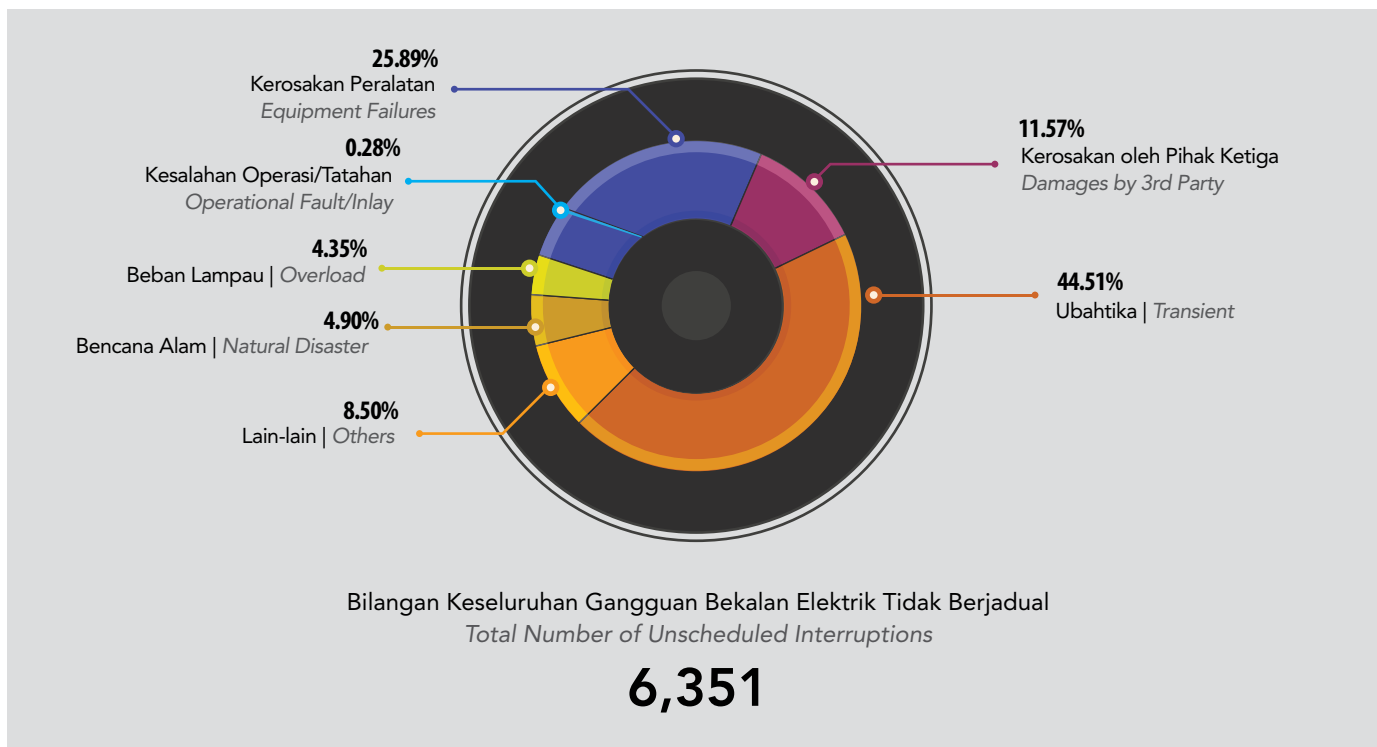
Chart 3: Monthly Average Electricity Supply Interruptions



**Jadual 2: Bilangan Gangguan Bekalan Elektrik**  
 Table 2: Number of Electricity Supply Interruptions

| Bilangan   Number   | 2008  | 2009  | 2010  | 2011  | 2012  |
|---|-------|-------|-------|-------|-------|
| Gangguan Tidak Berjadual   <i>Unscheduled Interruptions</i> | 6,301 | 6,040 | 6,338 | 5,976 | 6,351 |
| Gangguan Berjadual   <i>Scheduled Interruptions</i>         | 1,816 | 1,828 | 1,665 | 1,783 | 1,530 |
| Jumlah Gangguan   <i>Total Interruptions</i>                | 8,117 | 7,868 | 8,003 | 7,759 | 7,881 |

**Carta 4: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan**  
 Chart 4: Percentage of Unscheduled Supply Interruption by Type of Interruptions

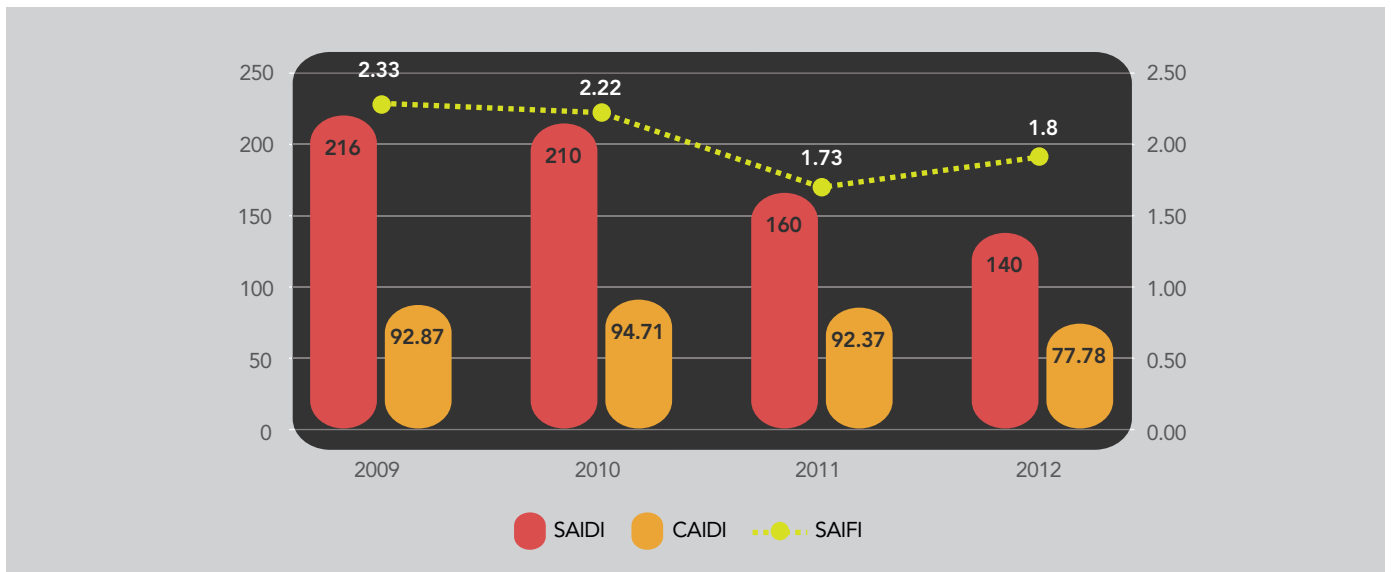




### SEB System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI)

Carta 5: SAIDI (Minit/ Pelanggan/ Tahun), SAIFI (Bilangan Gangguan/Pelanggan/Tahun), CAIDI (Minit/Pelanggan Terlibat/Tahun)

Chart 5: SAIDI (Minutes/Customer/ Year, SAIFI (Number of Interruptions/Customer/Year), CAIDI (Minutes/Involved Customer/Year)





**HARGA TENAGA ELEKTRIK**  
*ELECTRICITY PRICES*



## **TARIF-TARIF ELEKTRIK DI MALAYSIA** *ELECTRICITY TARIFFS IN MALAYSIA*

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- 54**    **Tarif-Tarif Elektrik bagi Tenaga Nasional Berhad (TNB)**  
*Electricity Tariffs for Tenaga Nasional Berhad (TNB)*
- 59**    **Tarif-Tarif Elektrik bagi Sabah Electricity Sdn. Bhd (SESB)**  
*Electricity Tariffs for Sabah Electricity Sdn. Bhd (SESB)*
- 60**    **Tarif-Tarif Elektrik bagi Sarawak Energy Berhad (SEB)**  
*Electricity Tariffs for Sarawak Energy Berhad (SEB)*

## Tarif-Tarif Elektrik bagi Tenaga Nasional Berhad (TNB)

### Electricity Tariffs for Tenaga Nasional Berhad (TNB)

Jadual 1: Tarif Elektrik TNB mengikut Sektor (Berkuat Kuasa 1 Jun 2011)  
Table 1: TNB Electricity Tariff by sector (Effective 1<sup>st</sup> June 2011)

| Kategori Tarif   Tariff Category   | Unit                      | Kadar   Rates |
|--|---------------------------|---------------|
| <b>Tarif A – Tarif Kediaman   Tariff A – Domestic Tariff</b>   |                           |               |
| 200 kWj pertama (1–200 kWj) sebulan<br><i>For the first 200 kWh (1-200 kWh) per month</i>  | sen/kWj<br><i>sen/kWh</i> | 21.80         |
| 100 kWj berikutnya (201–300 kWj) sebulan<br><i>For the next 100 kWh (201-300 kWh) per month</i>                                      | sen/kWj<br><i>sen/kWh</i> | 33.40         |
| 100 kWj berikutnya (301–400 kWj) sebulan<br><i>For the next 100 kWh (301-400 kWh) per month</i>                                      | sen/kWj<br><i>sen/kWh</i> | 40.00         |
| 100 kWj berikutnya (401–500 kWj) sebulan<br><i>For the next 100 kWh (401-500 kWh) per month</i>                                      | sen/kWj<br><i>sen/kWh</i> | 40.20         |
| 100 kWj berikutnya (501– 600 kWj) sebulan<br><i>For the next 100 kWh (501-600 kWh) per month</i>                                     | sen/kWj<br><i>sen/kWh</i> | 41.60         |
| 100 kWj berikutnya (601- 700 kWj) sebulan<br><i>For the next 100 kWh (601-700 kWh) per month</i>                                     | sen/kWj<br><i>sen/kWh</i> | 42.60         |
| 100 kWj berikutnya (701- 800 kWj) sebulan<br><i>For the next 100 kWh (701-800 kWh) per month</i>                                     | sen/kWj<br><i>sen/kWh</i> | 43.70         |
| 100 kWj berikutnya (801- 900 kWj) sebulan<br><i>For the next 100 kWh (801-900 kWh) per month</i>                                     | sen/kWj<br><i>sen/kWh</i> | 45.30         |
| Setiap kWj berikutnya (901 kWj ke atas) sebulan<br><i>For the next 100 kWh (901 and above) per month</i>                             | sen/kWj<br><i>sen/kWh</i> | 45.40         |
| Caj minimum bulanan   <i>Minimum monthly charge:</i>   | RM                        | 3.00          |
| <b>Tarif B – Tarif Perdagangan Voltan Rendah   Tariff B – Low Voltage Commercial Tariff</b>  |                           |               |
| Bagi Jumlah Penggunaan Keseluruhan di antara 0-200 kWj sebulan<br><i>For Overall Monthly Consumption between 0-200 kWh per month</i> | sen/kWj<br><i>sen/kWh</i> | 39.30         |
| Bagi Jumlah Penggunaan Keseluruhan Melebihi 200 kWj sebulan<br><i>For Overall Monthly Consumption more than 200 kWh per month</i>    | sen/kWj<br><i>sen/kWh</i> | 43.0          |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                        | 7.20          |
| <b>Tarif C1 – Tarif Perdagangan Am Voltan Sederhana   Tariff C1 Medium Voltage General Commercial Tariff</b>                         |                           |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>                               | RM/kW                     | 25.90         |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   <i>sen/kWh</i>  | 31.20         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                        | 600.00        |

| Kategori Tarif   Tariff Category   | Unit              | Kadar   Rates |
|--|-------------------|---------------|
| <b>Tarif C2 – Tarif Perdagangan Puncak/Luar Puncak Voltan Sederhana</b><br><i>Tariff C2 – Medium Voltage Peak/Off-Peak Commercial Tariff</i>                   |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i>              | RM/kW             | 38.60         |
| Bagi semua kWj dalam tempoh puncak   <i>For all kWh during the peak period</i>   | sen/kWj   sen/kWh | 31.20         |
| Bagi semua kWj dalam tempoh luar puncak   <i>For all kWh during the off-peak period</i>  | sen/kWj   sen/kWh | 19.20         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 600.00        |
| <b>Tarif D – Tarif Perindustrian Voltan Rendah   Tariff D – Low Voltage Industrial Tariff</b>  |                   |               |
| Bagi Jumlah Penggunaan Keseluruhan di antara 0-200 kWj sebulan<br><i>For Overall Monthly Consumption Between 0-200 kWh per month</i>                           | sen/kWj   sen/kWh | 34.50         |
| Bagi Jumlah Penggunaan Keseluruhan Melebihi 200 kWj sebulan<br><i>For Overall Monthly Consumption More Than 200 kWh per month</i>                              | sen/kWj   sen/kWh | 37.70         |
| Tarif Ds – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja)<br><i>Tariff Ds – Special Industrial Tariff (only for qualified consumers)</i>          | sen/kWj   sen/kWh | 35.90         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 7.20          |
| <b>Tarif E1 – Tarif Perindustrian Am Voltan Sederhana   Tariff E1 – Medium Voltage General Industrial Tariff</b>   |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW             | 25.30         |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   sen/kWh | 28.80         |
| <b>Tarif E1s – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja)</b><br><i>Tariff E1s – Special Industrial Tariff (only for qualified consumers)</i> |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW             | 19.90         |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   sen/kWh | 28.30         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 600.00        |
| <b>Tarif E2 – Tarif Perindustrian Puncak/Luar Puncak Voltan Sederhana</b><br><i>Tariff E2 – Medium Voltage Peak/Off-Peak Industrial Tariff</i>                 |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i>              | RM/kW             | 31.70         |
| Bagi semua kWj dalam tempoh puncak   <i>For all kWh during the peak period</i>   | sen/kWj   sen/kWh | 30.40         |
| Bagi semua kWj dalam tempoh luar puncak   <i>For all kWh during the off-peak period</i>  | sen/kWj   sen/kWh | 18.70         |
| <b>Tarif E2s – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja)</b><br><i>Tariff E2s – Special Industrial Tariff (only for qualified consumers)</i> |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW             | 19.90         |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   sen/kWh | 28.30         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 600.00        |

| Kategori Tarif   Tariff Category   | Unit              | Kadar   Rates |
|--|-------------------|---------------|
| <b>Tarif E3 – Tarif Perindustrian Puncak/Luar Puncak Voltan Tinggi</b><br><i>Tariff E3 – High Voltage Peak/Off-Peak Industrial Tariff</i>                      |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i>              | RM/kW             | 30.40         |
| Bagi semua kWj dalam tempoh puncak   <i>For all kWh during the peak period</i>   | sen/kWj   sen/kWh | 28.80         |
| Bagi semua kWj dalam tempoh luar puncak   <i>For all kWh during the off-peak period</i>  | sen/kWj   sen/kWh | 17.30         |
| <b>Tarif E3s – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja)</b><br><i>Tariff E3s – Special Industrial Tariff (only for qualified consumers)</i> |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i>              | RM/kW             | 24.40         |
| Bagi semua kWj dalam tempoh puncak   <i>For all kWh during the peak period</i>   | sen/kWj   sen/kWh | 26.70         |
| Bagi semua kWj dalam tempoh luar puncak   <i>For all kWh during the off-peak period</i>  | sen/kWj   sen/kWh | 14.70         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 600.00        |
| <b>Tarif F – Tarif Perlombongan Voltan Rendah   Tariff F – Low Voltage Mining Tariff</b>   |                   |               |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   sen/kWh | 32.60         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 120.00        |
| <b>Tarif F1 – Tarif Perlombongan Am Voltan Sederhana   Tariff F1 – Medium Voltage General Mining Tariff</b>  |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW             | 18.10         |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   sen/kWh | 26.80         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 120.00        |
| <b>Tarif F2 – Tarif Perlombongan Puncak/Luar Puncak Voltan Sederhana</b><br><i>Tariff F2 – Medium Voltage Peak/Off-Peak Mining Tariff</i>                      |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i>              | RM/kW             | 25.50         |
| Bagi semua kWj dalam tempoh puncak   <i>For all kWh during the peak period</i>   | sen/kWj   sen/kWh | 26.80         |
| Bagi semua kWj dalam tempoh luar puncak   <i>For all kWh during the off-peak period</i>  | sen/kWj   sen/kWh | 14.70         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 120.00        |
| <b>Tarif G – Tarif Lampu Jalanraya   Tariff G – Street Lighting Tariff</b>   |                   |               |
| Bagi semua kWj (termasuk senggaraan)   <i>For all kWh (including maintenance)</i>  | sen/kWj   sen/kWh | 26.10         |
| Bagi semua kWj (tidak termasuk senggaraan)   <i>For all kWh (excluding maintenance)</i>  | sen/kWj   sen/kWh | 16.40         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                | 7.20          |
| <b>Tarif G1 – Tarif Lampu Neon &amp; Lampu Limpah   Tariff G1 – Neon &amp; Floodlight Tariff</b>   |                   |               |

| Kategori Tariff   <i>Tariff Category</i>   | Unit                     | Kadar   <i>Rates</i> |
|--|--------------------------|----------------------|
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   <i>sen/kWh</i> | 17.80                |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                       | 7.20                 |
| <b>Tariff H - Tariff Pertanian Spesifik Voltan Rendah   <i>Tariff H - Low Voltage Specific Agriculture Tariff</i></b>  |                          |                      |
| Bagi Jumlah Penggunaan Keseluruhan di antara 0-200 kWj sebulan<br><i>For Overall Monthly Consumption between 200 kWh per month</i>                               | sen/kWj   <i>sen/kWh</i> | 36.90                |
| Bagi Jumlah Penggunaan Keseluruhan Melebihi 200 kWj sebulan<br><i>For Overall Monthly Consumption more than 200 kWh per month</i>                                | sen/kWj   <i>sen/kWh</i> | 40.30                |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                       | 7.20                 |
| <b>Tariff H1 – Tariff Pertanian Spesifik Am Voltan Sederhana   <i>Tariff H1 – Medium Voltage General Specific Agriculture Tariff</i></b>                         |                          |                      |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW                    | 25.90                |
| Bagi semua kWj   <i>For all kWh</i>  | sen/kWj   <i>sen/kWh</i> | 30.0                 |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                       | 600.00               |
| <b>Tariff H2 – Tariff Pertanian Spesifik Puncak/Luar Puncak Voltan Sederhana<br/><i>Tariff H2 - Medium Voltage Peak/Off-peak Specific Agriculture Tariff</i></b> |                          |                      |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i>                | RM/kW                    | 34.90                |
| Bagi semua kWj dalam tempoh puncak   <i>For all kWh during the peak period</i>   | sen/kWj   <i>sen/kWh</i> | 31.20                |
| Bagi semua kWj dalam tempoh luar puncak   <i>For all kWh during the off-peak period</i>  | sen/kWj   <i>sen/kWh</i> | 19.20                |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                       | 600.00               |

**Nota | Note :**

Berkuatkuasa mulai 1 September 2011, kutipan 1% Feed-in Tariff (FIT) untuk Dana Sumber Tenaga Boleh Baharu (RE) dikenakan ke atas bil elektrik bulanan pengguna (kecuali pengguna domestik dengan penggunaan tidak melebihi 300 kWj sebulan)

Effective starting from the 1st of September 2011, 1% Feed-in Tariff (FIT) for Renewable Energy Resources Fund (RE) is imposed on consumers' monthly electric bill (except for domestic consumers with consumption not exceeding 300 kWh per month)

**Jadual 2: Tarif Elektrik TNB untuk 'Top-Up' dan caj-caj 'Standby' untuk 'Co-Generators' (Berkuat Kuasa 1 Jun 2011)**  
 Table 2: TNB Electricity Tariff for 'Top-Up' and 'Standby' Charges for Co-Generators (Effective 1<sup>st</sup> June 2011)

| Kategori Tarif   Tariff Category   | Unit              | Kadar   Rates |         |
|--|-------------------|---------------|---------|
|  |                   | Top-up        | Standby |
| <b>Tarif C1 – Tariff Perdagangan Am Voltan Sederhana   Tariff C1 – Medium Voltage General Commercial Tariff</b>                            |                   |               |         |
| Caj kehendak maksimum sebulan   Maximum demand charge per month  | RM/kW             | 25.90         | 14.00   |
| Bagi semua kWj   For all kWh   | sen/kWj   sen/kWh | 31.20         |         |
| <b>Tarif C2 – Perdagangan Puncak/Luar Puncak Voltan Sederhana   Tariff C2 – Medium Voltage Peak/Off-Peak Commercial Tariff</b>             |                   |               |         |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br>For each kilowatt of maximum demand per month during the peak period | RM/kW             | 38.60         | 14.00   |
| Bagi semua kWj dalam tempoh puncak<br>For all kWh during the peak period   | sen/kWj   sen/kWh | 31.20         |         |
| Bagi semua kWj dalam tempoh luar puncak<br>For all kWh during the off-peak period  | sen/kWj   sen/kWh | 19.20         |         |
| <b>Tarif E1 – Perindustrian Am Voltan Sederhana   Tariff E1 – Medium Voltage General Industrial Tariff</b>                                 |                   |               |         |
| Caj kehendak maksimum sebulan   Maximum demand charge per month  | RM/kW             | 25.30         | 14.00   |
| Bagi semua kWj   For all kWh   | sen/kWj   sen/kWh | 28.80         |         |
| <b>Tarif E2 – Perindustrian Puncak/Luar Puncak Voltan Sederhana   Tariff E2 – Medium Voltage Peak/Off-Peak Industrial Tariff</b>           |                   |               |         |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br>For each kilowatt of maximum demand per month during the peak period | RM/kW             | 31.70         | 14.00   |
| Bagi semua kWj dalam tempoh puncak<br>For all kWh during the peak period   | sen/kWj   sen/kWh | 30.40         |         |
| Bagi semua kWj dalam tempoh luar puncak<br>For all kWh during the off-peak period  | sen/kWj   sen/kWh | 18.70         |         |
| <b>Tarif E3 – Perindustrian Puncak/Luar Puncak Voltan Tinggi   Tariff E3 – High Voltage Peak/Off-Peak Industrial Tariff</b>                |                   |               |         |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br>For each kilowatt of maximum demand per month during the peak period | RM/kW             | 30.40         | 12.00   |
| Bagi semua kWj dalam tempoh puncak<br>For all kWh during the peak period   | sen/kWj   sen/kWh | 28.80         |         |
| Bagi semua kWj dalam tempoh luar puncak<br>For all kWh during the off-peak period  | sen/kWj   sen/kWh | 17.30         |         |
| <b>Tarif F1 – Perlombongan Am Voltan Sederhana   Tariff F1 - Medium Voltage General Mining Tariff</b>                                      |                   |               |         |
| Caj kehendak maksimum sebulan   Maximum demand charge per month  | RM/kW             | 18.10         | 14.00   |
| Bagi semua kWj   For all kWh   | sen/kWj   sen/kWh | 26.80         |         |
| <b>Tarif F2 – Perlombongan Puncak/Luar Puncak Voltan Sederhana   Tariff F2 – Medium Voltage Peak/Off-Peak Mining Tariff</b>                |                   |               |         |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br>For each kilowatt of maximum demand per month during the peak period | RM/kW             | 25.50         | 14.00   |
| Bagi semua kWj dalam tempoh puncak<br>For all kWh during the peak period   | sen/kWj   sen/kWh | 26.80         |         |
| Bagi semua kWj dalam tempoh luar puncak<br>For all kWh during the off-peak period  | sen/kWj   sen/kWh | 14.70         |         |

**Nota | Note :**

Kadar standby baru (bermula 1 Jun 2011) akan digunakan oleh pengguna-pengguna berikut | This new Standby rate (as of 1<sup>st</sup> June 2011) is applicable to the following customers:-

- Kesemua pengguna baru co-generation | All new co-generation customers
- Pengguna co-generation sedia ada yang ingin bertukar kepada kadar Standby yang baru | Existing co-generation customers who wish to migrate to this new Standby rate.

Bagi pengguna co-generation yang ingin mengekalkan kadar Standby (Firm and Non-Firm) lama, kadar berikut boleh digunakan bersama kadar Top-up yang baru (bermula 1 June 2011)

For existing co-generation customer who wishes to maintain previous Standby (Firm and Non-Firm) rates, the rate is applicable together with the new Top-Up rate (as of 1<sup>st</sup> June 2011)



## Tarif-Tarif Elektrik bagi Sabah Electricity Sdn. Bhd. (SESB)

### Electricity Tariffs for Sabah Electricity Sdn. Bhd. (SESB)

**Jadual 3: Tarif Elektrik untuk Sabah Electricity Sdn. Bhd. dan Wilayah Persekutuan Labuan (Berkuatkuasa 15 Julai 2011)**  
 Table 3: Electricity Tariff for Sabah Electricity Sdn. Bhd. and Labuan Federal Territory (Effective 15<sup>th</sup> July 2011)

| Kategori Tarif   Tariff Category  | Unit              | Kadar   Rates |
|---|-------------------|---------------|
| <b>Tarif DM – Tarif Kediaman   Tariff DM – Domestic Tariff</b>  |                   |               |
| 100 kWj pertama (1-100 kWj) sebulan<br><i>For the first 100 kWh (1-100 kWh) per month</i>   | sen/kWj   sen/kWh | 17.50         |
| 100 kWj berikutnya (101-200 kWj) sebulan<br><i>For the next 100 kWh (101-200 kWh) per month</i>   | sen/kWj   sen/kWh | 18.50         |
| 300 kWj berikutnya (201-500 kWj) sebulan<br><i>For the next 300 kWh (201-500 kWh) per month</i>   | sen/kWj   sen/kWh | 33.00         |
| Setiap kWj berikutnya (501 kWj ke atas) sebulan<br><i>For the next kWh (501 onwards) per month</i>  | sen/kWj   sen/kWh | 34.50         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                | 5.00          |
| <b>Tarif CM1 – Tarif Perdagangan Voltan Rendah   Tariff CM1 – Low Voltage Commercial Tariff</b>   |                   |               |
| 200 kWj pertama (1-200 kWj) sebulan<br><i>For the first 200 kWh (1-200 kWh) per month</i>   | sen/kWj   sen/kWh | 33.00         |
| Setiap kWj berikutnya (201 kWj ke atas) sebulan<br><i>For the next kWh (201 kWh onwards) per month</i>  | sen/kWj   sen/kWh | 33.50         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                | 15.00         |
| <b>Tarif CM2 – Tarif Perdagangan Am Voltan Sederhana   Tariff CM2 – Medium Voltage General Commercial Tariff</b>                                  |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>  | RM/kW             | 18.50         |
| Bagi semua kWj   <i>For all kWh</i>   | sen/kWj   sen/kWh | 28.00         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                | 1,000.00      |
| <b>Tarif CM3 – Tarif Perdagangan Puncak/Luar Puncak Voltan Sederhana   Tariff CM3 – Medium Voltage Peak/Off Peak Commercial</b>                   |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i> | RM/kW             | 24.00         |
| Bagi semua kWj dalam tempoh puncak   <i>All units during the peak period</i>  | sen/kWj   sen/kWh | 28.80         |
| Bagi semua kWj dalam tempoh luar puncak   <i>All units during the off-peak period</i>   | sen/kWj   sen/kWh | 17.60         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                | 1,000.00      |
| <b>Tarif ID1 – Tarif Perindustrian Voltan Rendah   Tariff ID1 – Low Voltage Industrial Tariff</b>   |                   |               |
| Bagi semua kWj   <i>For all kWh</i>   | sen/kWj   sen/kWh | 32.00         |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                | 15.00         |
| <b>Tarif ID2 – Tarif Perindustrian Am Voltan Sederhana   Tariff ID2 – Medium Voltage General Industrial</b>                                       |                   |               |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>  | RM/kW             | 18.50         |
| Bagi semua kWj   <i>For all kWh</i>   | sen/kWj   sen/kWh | 22.80         |
| Caj minimum bulanan   <i>Minimum monthly charge</i> :   | RM                | 1,000.00      |

| Kategori Tarif   <i>Tariff Category</i>   | Unit                     | Kadar   Rates |
|---|--------------------------|---------------|
| <b>Tarif ID3 – Tarif Perindustrian Puncak/Luar Puncak Voltan Sederhana   <i>Tariff ID3 – Medium Voltage Peak/Off Peak Industrial</i></b>          |                          |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i> | RM/kW                    | 21.40         |
| Bagi semua kWj dalam tempoh puncak   <i>All units during the peak period</i>  | sen/kWj   <i>sen/kWh</i> | 26.5          |
| Bagi semua kWj dalam tempoh luar puncak   <i>All units during the off-peak period</i>   | sen/kWj   <i>sen/kWh</i> | 15.6          |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                       | 1,000.00      |
| <b>Tarif PL – Tarif Lampu Jalanraya   <i>Tariff PL – Public Lighting</i></b>  |                          |               |
| Bagi semua kWj (tidak termasuk senggaraan)   <i>For all kWh (excluding maintenance)</i>   | sen/kWj   <i>sen/kWh</i> | 16.0          |
| Bagi semua kWj (termasuk senggaraan)   <i>For all kWh (including maintenance)</i>   | sen/kWj   <i>sen/kWh</i> | 31.0          |
| Caj minimum bulanan   <i>Minimum monthly charge</i>   | RM                       | 15.00         |

## Tarif-Tarif Elektrik bagi Sarawak Energy Berhad (SEB)

### *Electricity Tariffs for Sarawak Energy Berhad (SEB)*

Jadual 4: Tarif Elektrik untuk Sarawak Energy Berhad (Berkuatkuasa 1 April 2007)  
Table 4: Electricity Tariff for Sarawak Energy Berhad (Effective 1<sup>st</sup> April 2007)

| Kategori Tarif   <i>Tariff Category</i>  | Unit                     | Kadar   Rates |
|--|--------------------------|---------------|
| <b>Tarif C1 – Perdagangan   <i>Tariff C1 – Commercial</i></b>  |                          |               |
| Bagi 100 unit pertama sebulan   <i>For the first 100 units per month</i>   | sen/kWj   <i>sen/kWh</i> | 40            |
| Bagi 4,900 unit berikutnya sebulan   <i>For the next 4,900 units per month</i>   | sen/kWj   <i>sen/kWh</i> | 34            |
| Bagi setiap unit tambahan sebulan   <i>For each additional unit per month</i>  | sen/kWj   <i>sen/kWh</i> | 30            |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                       | 10.00         |
| <b>Tarif C2 – Kehendak Perdagangan   <i>Tariff C2 – Commercial Demand</i></b>  |                          |               |
| Bagi setiap kilowatt kehendak maksimum bulanan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW                    | 16.00         |
| Bagi setiap unit   <i>All each unit</i>  | sen/kWj   <i>sen/kWh</i> | 25            |
| Caj minimum bulanan   <i>Minimum monthly charge</i><br>(per kW x Kehendak Bayaran Dikenakan   <i>Billing Demand</i> )                            | RM                       | 16.00         |
| <b>Tarif C3 – Kehendak Waktu Puncak/Waktu Bukan Puncak   <i>Tariff C3 – Commercial Peak/Off Peak Demand</i></b>                                  |                          |               |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam waktu puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i> | RM/kW                    | 20.00         |
| Bagi setiap unit waktu puncak   <i>For each unit during the peak period</i>  | sen/kWj   <i>sen/kWh</i> | 25            |
| Bagi setiap unit waktu bukan puncak   <i>For each unit during the off-peak period</i>  | sen/kWj   <i>sen/kWh</i> | 14.4          |
| Caj minimum bulanan   <i>Minimum monthly charge</i><br>(per kW x Kehendak Bayaran Dikenakan   <i>Billing Demand</i> )                            | RM                       | 20.00         |

| Kategori Tariff   <i>Tariff Category</i>   | Unit                     | Kadar   <i>Rates</i> |
|--|--------------------------|----------------------|
| <b>Tarif D – Domestik   <i>Tariff D – Domestic</i></b>   |                          |                      |
| Bagi 100 unit pertama sebulan   <i>For the first 100 units per month</i>   | sen/kWj   <i>sen/kWh</i> | 34                   |
| Bagi 300 unit berikutnya sebulan   <i>For the next 300 units per month</i>   | sen/kWj   <i>sen/kWh</i> | 29                   |
| Bagi setiap unit tambahan sebulan   <i>For each additional unit per month</i>  | sen/kWj   <i>sen/kWh</i> | 33                   |
| Caj minimum bulanan   <i>Minimum monthly charge</i><br>(per kW x Kehendak Bayaran Dikenakan   <i>Billing Demand</i> )                            | RM                       | 5.00                 |
| <b>Tarif I1 – Perindustrian   <i>Tariff I1 – Industrial</i></b>  |                          |                      |
| Bagi 100 unit pertama sebulan   <i>For the first 100 units per month</i>   | sen/kWj   <i>sen/kWh</i> | 40                   |
| Bagi 2900 unit berikutnya sebulan   <i>For the next 2900 units per month</i>   | sen/kWj   <i>sen/kWh</i> | 30                   |
| Bagi setiap unit tambahan sebulan   <i>For each additional unit per month</i>  | sen/kWj   <i>sen/kWh</i> | 27                   |
| Caj minimum bulanan   <i>Minimum monthly charge</i><br>(per kW x Kehendak Bayaran Dikenakan   <i>Billing Demand</i> )                            | RM                       | 10.00                |
| <b>Tarif I2 – Kehendak Perindustrian   <i>Tariff I2 – Industrial Demand</i></b>  |                          |                      |
| Bagi setiap kilowatt kehendak maksimum sebulan<br><i>For each kilowatt of maximum demand per month</i>   | RM/kW                    | 16.00                |
| Bagi setiap unit   <i>For each unit</i>  | sen/kWj   <i>sen/kWh</i> | 22.2                 |
| Caj minimum bulanan   <i>Minimum monthly charge</i><br>(per kW x Kehendak Bayaran Dikenakan   <i>Billing Demand</i> )                            | RM                       | 16.00                |
| <b>Tarif I3 – Kehendak Waktu Puncak/Waktu Bukan Puncak Perindustrian   <i>Tariff I3 – Industrial Peak/Off Peak Demand</i></b>                    |                          |                      |
| Bagi setiap kilowatt kehendak maksimum sebulan dalam waktu puncak<br><i>For each kilowatt of maximum demand per month during the peak period</i> | RM/kW                    | 20.00                |
| Bagi setiap unit waktu puncak   <i>For each unit during the peak period</i>  | sen/kWj   <i>sen/kWh</i> | 23.4                 |
| Bagi setiap unit bukan puncak   <i>For each unit during the off-peak period</i>  | sen/kWj   <i>sen/kWh</i> | 14.4                 |
| Caj minimum bulanan   <i>Minimum monthly charge</i><br>(per kW x Kehendak Bayaran Dikenakan   <i>Billing Demand</i> )                            | RM                       | 20.00                |
| <b>Tarif PL – Lampu Awam   <i>Tariff PL – Public Lighting</i></b>  |                          |                      |
| Bagi setiap unit   <i>For each unit</i>  | sen/kWj   <i>sen/kWh</i> | 47                   |
| Caj minimum bulanan   <i>Minimum monthly charge</i>  | RM                       | 10.00                |



## PURATA HARGA JUALAN DAN KOS-KOS PENJANAAN AVERAGE SELLING PRICE AND GENERATION COSTS

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- 63** Perbandingan Purata Harga Jualan (sen/kWj) antara Syarikat Utiliti Kuasa yang Terpilih  
*Comparison of Average Selling Price (sen/kWh) among Selected Power Utility Companies*
- 63** Kos-Kos Penjanaan Syarikat Utiliti Kuasa Utama  
*Generation Costs of Major Power Utility Companies*

## Perbandingan Purata Harga Jualan (sen/kWh) antara Syarikat Utiliti Kuasa yang Terpilih

### Comparison of Average Selling Price (sen/kWh) among Selected Power Utility Companies

Jadual 1: Perbandingan Purata Harga Jualan (sen/kWh) dengan Syarikat Utiliti Kuasa yang Terpilih

Table 1: Comparison of Average Selling Price (sen/kWh) among Selected Power Utility Companies

| Syarikat Utiliti Kuasa Terpilih<br>Power Utility Companies | Domestik<br>Domestic | Komersil<br>Commercial | Perindustrian<br>Industry | Lampu Awam<br>Public Lighting | Pertanian<br>Agriculture | Jumlah<br>Total |
|--|----------------------|------------------------|---------------------------|-------------------------------|--------------------------|-----------------|
| TNB  | 28.76                | 40.74                  | 30.91                     | 21.50                         | 39.82                    | 33.73           |
| SESB   | 25.08                | 32.98                  | 28.13                     | 18.51                         | -                        | 29.12           |
| SESCO  | 31.22                | 31.97                  | 24.9                      | 47.04                         | -                        | 29.68           |
| PLN, Indonesia   | 21.06                | 32.41                  | 23.7                      | 26.97                         | -                        | 24.34           |
| Taipower, Taiwan   | 30.07                | 35.93                  | 25.67                     | 12.53                         | -                        | 28.36           |
| EGAT, Thailand   | 37.76                | n/a                    | n/a                       | n/a                           | -                        | 35.94           |
| Meralco, Philippines                                       | 81.43                | 72.01                  | 57.26                     | 8.54                          | -                        | 70.4            |
| TEPCO, Japan   | 86.61                | n/a                    | n/a                       | n/a                           | -                        | 87.55           |
| KEPCO, Korea   | 34.85                | 31.75                  | 26.31                     | 27.76                         | 12.71                    | 28.05           |
| Singapore  | 57.5                 | 52.6                   | 49.8                      | n/a                           | -                        | 56.89           |

## Kos-Kos Penajaan Syarikat Utiliti Kuasa Utama

### Generation Costs of Major Power Utility Companies

Jadual 2: Kos Penajaan (sen/kWh) TNB

Table 2: TNB Generation Cost (sen/kWh)

| Kos Penajaan   Generation Cost                 | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| (a) Penajaan Sendiri   Own Generation          | 13.22 | 17.65 | 16.16 | 18.22 | 20.28 |
| (b) Tenaga Dibeli   Energy Purchased           | 17.50 | 23.01 | 21.99 | 24.68 | 25.05 |
| (c) Kos Keseluruhan   Overall Cost - (a) & (b) | 16.29 | 21.58 | 20.42 | 23.08 | 23.95 |

Jadual 3: Kos Penajaan (sen/kWh) SESB

Table 3: SESB Generation Cost (sen/kWh)

| Kos Penajaan   Generation Cost                 | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| (a) Penajaan Sendiri   Own Generation          | 12.8  | 15.23 | 17.42 | 24.30 | 16.16 |
| (b) Tenaga Dibeli   Energy Purchased           | 17.8  | 16.44 | 22.33 | 25.80 | 17.90 |
| (c) Kos Keseluruhan   Overall Cost - (a) & (b) | 16.00 | 16.15 | 21.21 | 25.20 | 17.40 |

Jadual 4: Kos Penajaan (sen/kWh) SEB

Table 4: SEB Generation Cost (sen/kWh)

| Kos Penajaan   Generation Cost                 | 2008 | 2009 | 2010 | 2011 | 2012  |
|--|------|------|------|------|-------|
| (a) Penajaan Sendiri   Own Generation          | 19.2 | 15.6 | 14.6 | 21.8 | 25.89 |
| (b) Tenaga Dibeli   Energy Purchased           | 13.6 | 15.4 | 14.2 | 13.2 | 11.72 |
| (c) Kos Keseluruhan   Overall Cost - (a) & (b) | 16.2 | 15.5 | 14.3 | 15.4 | 14.15 |



The background of the entire page is a photograph of several high-voltage power transmission towers. The towers are silhouetted against a vibrant sunset sky, which transitions from a deep blue at the top to a bright orange and red near the horizon. The towers are arranged in a line, receding into the distance. The text is overlaid on the upper left portion of the image.

**MAKLUMAT DAN STATISTIK INDUSTRI  
PEMBEKALAN ELEKTRIK**  
*INDUSTRY STATISTICS AND INFORMATION  
ON ELECTRICITY SUPPLY INDUSTRY*



# MAKLUMAT DAN STATISTIK INDUSTRI DI SEMENANJUNG MALAYSIA *INDUSTRY INFORMATION AND STATISTICS IN PENINSULAR MALAYSIA*

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- 66** Tenaga Nasional Berhad (TNB)
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- 72** Co-Generators Utama  
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## Tenaga Nasional Berhad (TNB)

**Jadual 1: Sorotan Prestasi**

Table 1: Performance Highlights

| Petunjuk   Indicator   | 2008   | 2009   | 2010   | 2011   | 2012   |
|--|--------|--------|--------|--------|--------|
| Kehendak Maksimum (MW)   Maximum Demand (MW)   | 14,007 | 14,245 | 15,072 | 15,476 | 15,826 |
| Jumlah Unit Penjanaan (GWj)   Total Units Generated (GWh) <sup>1</sup>   | 27,691 | 29,608 | 27,689 | 24,018 | 26,329 |
| Jumlah Unit Jualan (GWj)   Total Units Sold (GWh)  | 85,616 | 82,443 | 89,621 | 93,713 | 97,256 |
| Hasil Jualan Elektrik (RM Juta)   Sales of Electricity (RM million)  | 22,555 | 26,388 | 28,020 | 29,273 | 32,464 |
| Kapasiti Penjanaan Terpasang (MW) <sup>2</sup><br>Installed Generation Capacity (MW)                           | 6,365  | 7,040  | 7,040  | 7,054  | 6,986  |
| Jumlah Kakitangan   Number of Employees <sup>3</sup>   | 24,927 | 24,613 | 25,571 | 26,732 | 28,105 |
| Hasil Jualan Setiap Kakitangan (RM Juta/Kakitangan)<br>Sales of Electricity per Employee (RM Million/Employee) | 0.90   | 1.07   | 1.10   | 1.10   | 1.16   |
| Unit Jualan Setiap Kakitangan (GWj/Kakitangan)<br>Units Sold per Employee (GWh/Employee)                       | 3.43   | 3.35   | 3.50   | 3.46   | 3.43   |
| Kapasiti Penjanaan Setiap Kakitangan (MW/Kakitangan)<br>Installed Capacity per Employee (MW/Employee)          | 0.26   | 0.29   | 0.28   | 0.26   | 0.25   |
| Jumlah Unit Pembelian (GWj)   Total Units Purchased (GWh)  | 68,091 | 63,156 | 73,830 | 76,887 | 81,733 |
| Jumlah Unit Eksport (GWj)   Total Units Exported (GWh)   | 1,152  | 166    | 88     | 73     | 13     |
| Jumlah Unit Import (GWj)   Total Units Imported (GWh)  | 0.11   | 0.06   | 0.03   | 224.88 | 100.00 |

**Jadual 2: Kapasiti Penjanaan Terpasang (MW) dan Kebolehdapatan Keseluruhan (%)**

Table 2: Installed Generation Capacity (MW) and Overall Availability (%)

| Jenis Bahan Api   Fuel Type                                      | 2008         | 2009         | 2010         | 2011         | 2012         |
|--|--------------|--------------|--------------|--------------|--------------|
| Hidro   Hydro  | 1,911        | 1,911        | 1,911        | 1,911        | 1,911        |
| Gas Asli   Natural Gas   | 4,386        | 5,061        | 5,061        | 5,075        | 5,075        |
| Arang batu   Coal  | -            | -            | -            | -            | -            |
| Minyak   Medium Fuel Oil (MFO)                                   | -            | -            | -            | -            | -            |
| Disel   Diesel   | 68           | 68           | 68           | 68           | -            |
| Lain-lain   Others   | -            | -            | -            | -            | -            |
| <b>Jumlah   Total</b>  | <b>6,365</b> | <b>7,040</b> | <b>7,040</b> | <b>7,054</b> | <b>6,986</b> |
| <b>Kebolehdapatan Keseluruhan (%)   Overall Availability (%)</b> | <b>90</b>    | <b>91</b>    | <b>89.4</b>  | <b>86.8</b>  | <b>93.5</b>  |

**Jadual 3: Campuran Penjana (GWj)**

Table 3: Generation Mix (GWh)

| Jenis Bahan Api   Fuel Type    | 2008   | 2009   | 2010   | 2011   | 2012   |
|--------------------------------|--------|--------|--------|--------|--------|
| Hidro   Hydro                  | 6,669  | 5,916  | 5,227  | 5,950  | 5,524  |
| Gas Asli   Natural Gas         | 20,979 | 23,658 | 22,337 | 15,915 | 19,558 |
| Arang batu   Coal              | -      | -      | -      | -      | -      |
| Minyak   Medium Fuel Oil (MFO) | -      | -      | 6      | 686    | 86     |
| Disel   Diesel                 | 43     | 34     | 119    | 1,468  | 1,161  |
| Lain-lain   Others             | -      | -      | -      | -      | -      |
| Jumlah   Total                 | 27,691 | 29,608 | 27,689 | 24,018 | 26,329 |

**Jadual 4: Jualan Tenaga Elektrik (GWj)**

Table 4: Sales of Electricity (GWh)

| Sektor   Sector                              | 2008   | 2009   | 2010   | 2011   | 2012   |
|--|--------|--------|--------|--------|--------|
| Domestik   Domestic                          | 15,810 | 16,792 | 18,217 | 18,916 | 20,301 |
| Komersil   Commercial                        | 26,939 | 27,859 | 29,872 | 31,755 | 33,218 |
| Industri   Industry                          | 40,511 | 36,261 | 40,071 | 41,449 | 42,047 |
| Lampu Awam   Public Lighting                 | 956    | 1,078  | 1,046  | 1,139  | 1,235  |
| Perlombongan   Mining                        | 34     | 47     | 62     | 75     | 98     |
| Eksport (EGAT)   Export (EGAT)               | 1,152  | 166    | 88     | 73     | 13     |
| Lain-lain (Pertanian)   Others (Agriculture) | 214    | 240    | 265    | 306    | 344    |
| Jumlah   Total <sup>4</sup>                  | 85,616 | 82,443 | 89,621 | 93,713 | 97,256 |

**Jadual 5: Bilangan Pengguna**

Table 5: Number of Consumers

| Sektor   Sector                              | 2008      | 2009      | 2010      | 2011      | 2012      |
|--|-----------|-----------|-----------|-----------|-----------|
| Domestik   Domestic                          | 5,750,325 | 5,938,095 | 6,128,224 | 6,288,281 | 6,456,647 |
| Komersil   Commercial                        | 1,110,718 | 1,164,959 | 1,224,414 | 1,281,108 | 1,334,371 |
| Industri   Industry                          | 25,330    | 25,663    | 25,580    | 26,203    | 27,599    |
| Lampu Awam   Public Lighting                 | 45,037    | 47,715    | 50,122    | 53,075    | 56,715    |
| Perlombongan   Mining                        | 13        | 15        | 17        | 20        | 22        |
| Lain-lain (Pertanian)   Others (Agriculture) | 906       | 996       | 1,080     | 1,166     | 1,241     |
| Unit Percuma   Free Units <sup>5</sup>       | -         | -         | 2,218     | 2,264     | 2,271     |
| Jumlah   Total                               | 6,932,329 | 7,177,443 | 7,431,655 | 7,652,117 | 7,878,866 |

**Jadual 6: Keupayaan Sistem Penghantaran**

Table 6: Transmission System Capacity

| Talian/Kabel Sistem Penghantaran<br>Transmission System Lines/Cables | 2008             | 2009               | 2010               | 2011               | 2012               |
|--|------------------|--------------------|--------------------|--------------------|--------------------|
| 500 kV (km)  | <sup>6</sup> 890 | <sup>7</sup> 1,209 | <sup>8</sup> 1,094 | <sup>8</sup> 1,094 | <sup>8</sup> 1,295 |
| 275 kV (km)  | 7,616            | 7,738              | 8,028              | 8,425              | 8,449              |
| 132 kV (km)  | 11,299           | 11,308             | 11,415             | 11,672             | 11,640             |
| 66 kV (km)   | -                | -                  | <sup>9</sup> 0.9   | -                  | -                  |
| <b>Pencawang Penghantaran   Transmission Substations</b>             |                  |                    |                    |                    |                    |
| Bilangan   Number  | 386              | 385                | 392                | 399                | 401                |
| Keupayaan   Capacity (MVA)   | 83,808           | 82,990             | 86,030             | 94,325             | 94,265             |
| <b>Prestasi   Performance</b>  |                  |                    |                    |                    |                    |
| Bilangan Kejadian Pelantikan<br>Number of Tripping Incidents         | 392              | 333                | 322                | 305                | 276                |
| Tenaga Yang Tidak Dibekal (MWj)<br>Unsupplied Energy (MWh)           | 1,532            | 242                | 215                | 261                | 271                |

**Jadual 7: Keupayaan Sistem Pengagihan**

Table 7: Distribution System Capacity

| Talian/Kabel Sistem Pengagihan<br>Distribution System Lines/Cables      | 2008    | 2009    | 2010    | 2011    | 2012    |
|---|---------|---------|---------|---------|---------|
| Talian Atas   Overhead Lines (km)                                       | 191,714 | 341,318 | 475,972 | 477,191 | 495,925 |
| Kabel Bawah Tanah   Underground Cables (km)                             | 357,267 | 361,763 | 376,226 | 379,661 | 423,758 |
| <b>Pencawang Pengagihan   Distribution Substations</b>                  |         |         |         |         |         |
| Bilangan   Number   | 61,238  | 62,852  | 63,341  | 65,556  | 67,925  |
| Keupayaan   Capacity (MVA)  | 66,696  | 68,454  | 69,456  | 125,222 | 126,969 |
| <b>Prestasi   Performance</b>   |         |         |         |         |         |
| Bilangan Gangguan Bekalan   Number of Supply Interruption <sup>10</sup> | 103,876 | 126,566 | 110,633 | 90,979  | 84,925  |

Nota | Note :

- Jumlah Unit Penjanaaan (Jumlah Campuran Penjanaaan) bagi TNB tidak termasuk IPPs di Semenanjung Malaysia  
Total Units Generated (Generation Mix) for TNB excluding IPPs in Peninsular Malaysia
- Jumlah Kapasiti Penjanaaan Terpasang TNB tidak termasuk IPPs  
Installed Generation Capacity for TNB excluding IPPs in Peninsular Malaysia
- Kakitangan TNB tidak termasuk anak syarikat milik penuh TNB dan anak syarikat mempunyai saham terbesar  
TNB employees excluding TNB wholly owned subsidiaries and TNB majority owned subsidiaries
- Jualan Tenaga Elektrik bagi TNB termasuk penjanaaan sendiri oleh TNB dan tenaga dibeli dari IPPs di Semenanjung Malaysia  
Sales of Electricity for TNB includes TNB own generation and energy purchased from IPPs in Peninsular Malaysia
- Unit Percuma merupakan bekalan elektrik yang tidak dikenakan bayaran bil bulanan. Premis yang layak merupakan premis-premis TNB termasuk bangunan pejabat, rumah kelab, kuarters, pencawang masuk utama, pencawang pembahagian utama dan pencawang elektrik  
Free Units refers to electricity provided for free without being charged for monthly bill payments. Eligible premises are TNB premises including office buildings, clubhouse, quarters, main substations, transmission substations and distribution substations
- Sepanjang 440 km talian penghantaran 500 kV dikendalikan pada voltan 275 kV  
440 km of transmission lines were operated at 275 kV
- Sepanjang 541 km talian penghantaran 500 kV dikendalikan pada voltan 275 kV  
541 km of transmission lines were operated at 275 kV
- Sepanjang 425.92 km talian penghantaran 500 kV dikendalikan pada voltan 275 kV  
425.92 km of transmission lines were operated at 275 kV
- Talian 66 kV yang berjumlah 0.9 km telah pun dihentitugas pada 16 September 2011  
66kV lines amounting to 0.9 km has been terminated on 16 September 2011
- Angka ini meliputi pengguna tunggal yang mengalami gangguan melebihi 1 minit  
This figure includes single consumers with duration of interruptions of more than 1 minute

## Penjana-Penjana Kuasa Bebas (IPPs)

### Independent Power Producers (IPPs)

Jadual 8: Kapasiti Berlesen, Unit Penjanaan dan Unit Jualan

Table 8: Licensed Capacity, Units Generated and Units Sold

| No.                 | Pemegang Lesen & Lokasi<br>Licensee & Location      | Jenis Loji<br>Plant Type     | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Unit Penjanaan (GWj)<br>Units Generated (GWh) | Unit Jualan (GWj)<br>Units Sold (GWh) |
|---------------------|---|------------------------------|--|---|---------------------------------------|
| 1                   | <b>YTL Power Generation Sdn. Bhd.</b>               |                              |  |   |                                       |
|                     | Paka, Terengganu                                    | Kitar Padu<br>Combined Cycle | 780.0  | 7,540.00                                      | 7,407.18                              |
| Pasir Gudang, Johor | 390.0   |                              |  |   |                                       |
| 2                   | <b>Genting Sanyen Power Sdn. Bhd.</b>               |                              |  |   |                                       |
|                     | Kuala Langat, Selangor                              | Kitar Padu<br>Combined Cycle | 762.0  | 4,053.96                                      | 3,955.19                              |
| 3                   | <b>Segari Energy Ventures Sdn. Bhd.</b>             |                              |  |   |                                       |
|                     | Manjung, Perak                                      | Kitar Padu<br>Combined Cycle | 1,303.0  | 3,126.57                                      | 3,077.87                              |
| 4                   | <b>Powertek Bhd.</b>                                |                              |  |   |                                       |
|                     | Alor Gajah, Melaka                                  | Turbin Gas<br>Gas Turbines   | 440.0  | 61.9  | 60.53                                 |
| 5                   | <b>Port Dickson Power Bhd.</b>                      |                              |  |   |                                       |
|                     | Port Dickson, Negeri Sembilan                       | Turbin Gas<br>Gas Turbines   | 440.0  | 85.71   | 85.70                                 |
| 6                   | <b>Musteq Hydro Sdn. Bhd.</b>                       |                              |  |   |                                       |
|                     | Sg. Kenerong, Kelantan                              | Mini Hidro<br>Mini Hydro     | 20.0   | 103.47  | 103.47                                |
| 7                   | <b>TNB Janamanjung Sdn. Bhd. <sup>1</sup></b>       |                              |  |   |                                       |
|                     | Manjung, Perak                                      | Arang Batu<br>Coal           | 2,100.0  | 15,933.45                                     | 14,737.01                             |
| 8                   | <b>Teknologi Tenaga Perlis Consortium Sdn. Bhd.</b> |                              |  |   |                                       |
|                     | Kuala Sungai Baru, Perlis                           | Kitar Padu<br>Combined Cycle | 650.0  | 4,584.85                                      | 4,512.91                              |
| 9                   | <b>Nur Generation Sdn. Bhd.</b>                     |                              |  |   |                                       |
|                     | Kulim High-Tech Industrial Park, Kedah              | Kitar Padu<br>Combined Cycle | 440.0  | 1,226.55                                      | 1,206.53                              |
| 10                  | <b>Pahlawan Power Sdn. Bhd.</b>                     |                              |  |   |                                       |
|                     | Melaka Tengah, Melaka                               | Kitar Padu<br>Combined Cycle | 334.0  | 1,774.67                                      | 1,739.95                              |
| 11                  | <b>Prai Power Sdn. Bhd.</b>                         |                              |  |   |                                       |
|                     | Seberang Perai Tengah, Pulau Pinang                 | Kitar Padu<br>Combined Cycle | 350.0  | 2,380.86                                      | 2,332.55                              |
| 12                  | <b>GB3 Sdn. Bhd.</b>                                |                              |  |   |                                       |
|                     | Manjung Perak                                       | Kitar Padu<br>Combined Cycle | 640.0  | 3,384.99                                      | 3,341.34                              |
| 13                  | <b>Panglima Power Sdn. Bhd.</b>                     |                              |  |   |                                       |
|                     | Alor Gajah, Melaka                                  | Kitar Padu<br>Combined Cycle | 720.0  | 4,412.51                                      | 4,283.42                              |

| No.                               | Pemegang Lesen & Lokasi<br><i>Licensee &amp; Location</i> | Jenis Loji<br><i>Plant Type</i> | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Unit Penjanaan (GWh)<br><i>Units Generated (GWj)</i> | Unit Jualan (GWh)<br><i>Units Sold (GWj)</i> |
|-----------------------------------|---|---------------------------------|--|--|--|
| 14                                | <b>Tanjung Bin Power Sdn. Bhd.</b>                        |                                 |  |  |  |
|                                   | Mukim Serkat, Daerah Pontian, Johor                       | Arang Batu   Coal               | 2,100.0  | 15,265.83  | 14,571.9                                     |
| 15                                | <b>Kapar Energy Ventures Sdn. Bhd.</b>                    |                                 |  |  |  |
|                                   | Klang, Selangor   | Minyak/Gas<br><i>Oil / Gas</i>  | 2,420.0  | 12,638.26  | 11,785.71                                    |
|                                   |   | Arang Batu<br><i>Coal</i>       |  |  |  |
| Turbin Gas<br><i>Gas Turbines</i> |   |                                 |  |  |  |
| 16                                | <b>Jimah Energy Ventures Sdn. Bhd.</b>                    |                                 |  |  |  |
|                                   | Port Dickson, Negeri Sembilan                             | Arang Batu<br><i>Coal</i>       | 1,400.0  | 10,967.4   | 10,366.57                                    |

Nota | Note :

<sup>1</sup> Anak Syarikat TNB | TNB Subsidiary

## Projek-Projek Jana Kuasa Tenaga Boleh Baharu (TBB)

### Renewable Energy (RE) Power Projects

Jadual 9: Kapasiti Berlesen, Unit Penjanaan dan Unit Jualan

Table 9: Licensed Capacity, Units Generated and Units Sold

| No. | Pemegang Lesen & Lokasi<br><i>Licensee &amp; Location</i> | Jenis Loji<br><i>Plant Type</i>      | Bahan Api/<br>Pengerak<br><i>Fuel Type/Prime Mover</i>      | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Unit Penjanaan<br>(MWj)<br><i>Units Generated (MWh)</i> | Unit Jualan<br>(MWj)<br><i>Unit Sold (MWh)</i> |
|-----|---|--------------------------------------|---|--|---|--|
| 1   | <b>Jana Landfill Sdn. Bhd.</b>                            |                                      |   |  |   |  |
|     | Seri Kembangan, Selangor.                                 | Turbin Gas<br><i>Gas Turbines</i>    | Gas Landfill<br><i>Landfill Gas</i>                         | 2.0  | 9,942.73  | 9,942.73                                       |
| 2   | <b>Recycle Energy Sdn. Bhd.</b>                           |                                      |   |  |   |  |
|     | Kajang, Selangor.   | Turbin Stim<br><i>Steam Turbines</i> | Sampah Yang<br>Telah Diproses<br><i>Refuse Derived Fuel</i> | 8.9  | 16,885.43   | 10,422.78                                      |
| 3   | <b>MHES Asia Sdn. Bhd.</b>                                |                                      |   |  |   |  |
|     | Jempol, Negeri Sembilan.                                  | Turbin Stim<br><i>Steam Turbines</i> | Sisa Sawit<br><i>Palm Waste</i>                             | 13.0   | 32,372.32   | 21,193.11                                      |
| 4   | <b>Sunquest Sdn. Bhd.</b>                                 |                                      |   |  |   |  |
|     | Port Dickson, Negeri Sembilan.                            | Turbin Stim<br><i>Steam Turbines</i> | Sisa Sawit<br><i>Palm Waste</i>                             | 6.5  | 2,773.70  | 2,429.71                                       |
| 5   | <b>Amcorp Perting Hydro Sdn. Bhd.</b>                     |                                      |   |  |   |  |
|     | Bentong, Pahang.  | Mini Hidro<br><i>Mini Hydro</i>      | Air<br><i>Water</i>   | 4.2  | 31,713.30   | 31,713.00                                      |
| 6   | <b>I.S. Energy Sdn. Bhd.</b>                              |                                      |   |  |   |  |
|     | Kuala Krai, Kelantan.                                     | Mini Hidro<br><i>Mini Hydro</i>      | Air<br><i>Water</i>   | 2.8  | 3,742.58  | 3,401.86                                       |
| 7   | <b>Renewable Power Sdn. Bhd.</b>                          |                                      |   |  |   |  |
|     | Hulu Selangor, Selangor                                   | Mini Hidro<br><i>Mini Hydro</i>      | Air<br><i>Water</i>   | 2.2  | 12,862.89   | 12,413.22                                      |

| No. | Pemegang Lesen & Lokasi<br>Licensee & Location            | Jenis Loji<br>Plant Type              | Bahan Api/<br>Penggerak<br>Fuel Type/Prime<br>Mover | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Unit Penjanaan<br>(MWj)<br>Units Generated<br>(MWh) | Unit Jualan<br>(MWj)<br>Unit Sold<br>(MWh) |
|-----|---|---------------------------------------|---|--|---|--|
| 8   | <b>Bell Eco Power Sdn. Bhd.</b>                           |                                       |   |  |   |  |
|     | Batu Pahat, Johor.  | Turbin Gas<br>Gas Turbines            | Palm Oil Mill<br>Effluent (POME)                    | 2.0  | 3,557.76  | 2,813.53                                   |
| 9   | <b>Achi Jaya Plantations Sdn. Bhd.</b>                    |                                       |   |  |   |  |
|     | Segamat, Johor.   | Biogas<br>Biogas                      | Palm Oil Mill<br>Effluent (POME)                    | 1.3  | 5,191.10  | 5,191.10                                   |
| 10  | <b>Pesaka Technologies Sdn. Bhd. <sup>1</sup></b>         |                                       |   |  |   |  |
|     | Gua Musang, Kelantan.                                     | Mini Hidro<br>Mini Hydro              | Air<br>Water  | 11.4   | -   | -  |
| 11  | <b>Kub-Berjaya Energy Sdn. Bhd.</b>                       |                                       |   |  |   |  |
|     | Hulu Selangor, Selangor.                                  | Turbin Gas<br>Gas Turbines            | Gas Landfill<br>Landfill Gas                        | 1.2  | 6,609.34  | 5,882.31                                   |
| 12  | <b>Felda Palm Industries Sdn. Bhd.</b>                    |                                       |   |  |   |  |
|     | Jempul, Negeri Sembilan.                                  | Biojisim<br>Biomass                   | Tandan Sawit<br>Kosong<br>EFB                       | 1.5  | n/a   | n/a  |
| 13  | <b>Perbadanan Memajukan Iktisad Negeri Terengganu</b>     |                                       |   |  |   |  |
|     | Marang, Terengganu  | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 0.5  | 67.78   | 137.58                                     |
| 14  | <b>Malaysian Green Technology Corporation</b>             |                                       |   |  |   |  |
|     | Kajang, Selangor  | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 0.1  | 110.40  | 17.348                                     |
| 15  | <b>Suria KLCC Sdn. Bhd.</b>                               |                                       |   |  |   |  |
|     | Wilayah Persekutuan<br>Kuala Lumpur                       | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 0.7  | 526.10  | 0  |
| 16  | <b>Cypark Suria (Negeri Sembilan) Sdn. Bhd.</b>           |                                       |   |  |   |  |
|     | Nilai, Negeri Sembilan                                    | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 3  | 1,888.54  | 0  |
| 17  | <b>Cypark Suria (Pajam) Sdn. Bhd. <sup>1</sup></b>        |                                       |   |  |   |  |
|     | Sentul, Negeri Sembilan                                   | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 5.0  | -   | -  |
| 18  | <b>Jana Landfill Sdn. Bhd. <sup>1</sup></b>               |                                       |   |  |   |  |
|     | Kuala Selangor, Selangor                                  | Biogas<br>Biogas                      | Gas Landfill<br>Landfill Gas                        | 1.1  | -   | -  |
| 19  | <b>Alpha Automation (Selangor) Sdn. Bhd. <sup>1</sup></b> |                                       |   |  |   |  |
|     | Nilai, Negeri Sembilan                                    | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 0.2  | -   | -  |
| 20  | <b>Macglo Steel Service Centre Sdn. Bhd. <sup>1</sup></b> |                                       |   |  |   |  |
|     | Shah Alam, Selangor                                       | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 0.5  | -   | -  |
| 21  | <b>Exotic Access Sdn. Bhd. <sup>1</sup></b>               |                                       |   |  |   |  |
|     | Mukim Kapar, Selangor                                     | Suria Fotovolta<br>Solar Photovoltaic | Suria<br>Solar                                      | 0.5  | -   | -  |

Nota | Note :

<sup>1</sup> Belum Beroperasi | Not in operation

n/a Tiada maklumat | Not available

## Co-Generators Utama

### Major Co-Generators

Jadual 10: Kapasiti Berlesen dan Unit Penjanaan (Lesen Awam)

Table 10: Licensed Capacity and Units Generated (Public Licence)

| No. | Pemegang Lesen & Lokasi<br>Licensee & Location    | Kapasiti Berlesen<br>Licensed Capacity (MW) | Bahan Api<br>Fuel Type   | Unit Penjanaan (MWj)<br>Units Generated (MWh) |
|-----|---|---|--|---|
| 1   | <b>Gas District Cooling (KLCC) Sdn. Bhd.</b>      |   |  |   |
|     | Jalan Ampang, Kuala Lumpur.                       | 40.00                                       | Gas Asli<br>Natural Gas  | 84,608.58                                     |
| 2   | <b>Gas District Cooling (KLIA) Sdn. Bhd.</b>      |   |  |   |
|     | Sepang, Selangor.                                 | 60.00                                       | Gas Asli<br>Natural Gas  | n/a   |
| 3   | <b>See Sen Chemical Bhd.</b>                      |   |  |   |
|     | Kemaman, Terengganu.                              | 6.00  | Haba Buangan Proses<br>Perindustrian<br>Industrial Process Waste<br>Heat | 22,200.81                                     |
| 4   | <b>Shell Refining Company (FOM) Berhad</b>        |   |  |   |
|     | Port Dickson, Negeri Sembilan.                    | 35.00                                       | Minyak<br>Oil  | n/a   |
| 5   | <b>Petronas Gas Berhad</b>                        |   |  |   |
|     | Kerteh Industrial Area, Terengganu.               | 210.00                                      | Gas Asli<br>Natural Gas  | 1,356,875.39                                  |
| 6   | <b>Petronas Gas Berhad</b>                        |   |  |   |
|     | Gebeng Industrial Area, Pahang.                   | 105.00                                      | Gas Asli<br>Natural Gas  | 775,327.40                                    |
| 7   | <b>Institute Of Technology Petronas Sdn. Bhd.</b> |   |  |   |
|     | Tronoh, Perak.                                    | 8.40  | Gas Asli<br>Natural Gas  | 39,224.35                                     |
| 8   | <b>Fusion Energy Sdn. Bhd.<sup>1</sup></b>        |   |  |   |
|     | Kuala Langat, Selangor.                           | 418.00                                      | Gas Buangan Proses<br>Perindustrian<br>Industrial Process Waste<br>Heat  | -   |
| 9   | <b>Perstima Utility Sdn. Bhd.</b>                 |   |  |   |
|     | Johor Bahru Johor.                                | 5.67  | Gas Asli<br>Natural Gas  | 18,596.40                                     |
| 10  | <b>Optimistic Organic Sdn. Bhd.</b>               |   |  |   |
|     | Kemaman, Terengganu.                              | 7.00  | Haba Buangan Proses<br>Perindustrian<br>Industrial Process Waste<br>Heat | n/a   |

Nota | Note :

<sup>1</sup> Belum Beroperasi | Not in operation

n/a Tiada maklumat | Not available



**Jadual 11: Kapasiti Berlesen dan Unit Penjanaaan (Lesen Persendirian)**

Table 11: Licensed Capacity and Units Generated (Private Licence)

| No. | Pemegang Lesen & Lokasi<br><i>Licensee &amp; Location</i> | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Bahan Api<br><i>Fuel Type</i>  | Unit Penjanaaan<br>(MWj)<br><i>Units Generated (MWh)</i> |
|-----|---|--|--|--|
| 1   | <b>Perwaja Steel Sdn. Bhd.</b>                            | 9.50   | Gas Asli<br><i>Natural Gas</i>   | n/a  |
|     | Kemaman, Terengganu.                                      |  |  |  |
| 2   | <b>Bernas Production Setia Sdn. Bhd.</b>                  | 0.23   | Bahan Buangan<br>Pertanian<br><i>Agricultural Waste</i>                  | n/a  |
|     | Sekincan, Selangor.                                       |  |  |  |
| 3   | <b>Padiberas Nasional Berhad</b>                          | 0.65   | Bahan Buangan<br>Pertanian<br><i>Agricultural Waste</i>                  | n/a  |
|     | Kampong Gajah, Perak.                                     |  |  |  |
| 4   | <b>Sime Darby Plantation Sdn. Bhd.</b>                    | 3.38   | Bahan Buangan<br>Pertanian<br><i>Agricultural Waste</i>                  | 4,421.86   |
|     | Batang Berjantai, Selangor.                               |  |  |  |
| 5   | <b>Sime Darby Plantation Sdn. Bhd.</b>                    | 1.50   | Bahan Buangan<br>Pertanian / Disel<br><i>Agricultural Waste / Diesel</i> | 4,860.51   |
|     | Teluk Intan, Perak.                                       |  |  |  |
| 6   | <b>Malaysian Newsprint Industries Sdn. Bhd.</b>           | 79.20  | Bahan Buangan<br>Pertanian<br><i>Agricultural Waste</i>                  | 6,542.00   |
|     | Mentakab, Pahang.   |  |  |  |
| 7   | <b>Titan Petchem (M) Sdn. Bhd.</b>                        | 56.00  | Gas Asli<br><i>Natural Gas</i>   | 66,786.00  |
|     | Pasir Gudang, Johor.                                      |  |  |  |
| 8   | <b>Titan Petrochemicals (M) Sdn. Bhd.</b>                 | 42.60  | Gas Asli<br><i>Natural Gas</i>   | 43,098.00  |
|     | Johor Bahru, Johor.                                       |  |  |  |
| 9   | <b>Tiang Siang Oil Mill (Perak) Sdn. Bhd.</b>             | 4.76   | Bahan Buangan<br>Pertanian<br><i>Agricultural Waste</i>                  | 257.67   |
|     | Beruas, Perak.  |  |  |  |
| 10  | <b>Central Sugars Refinery Sdn. Bhd.</b>                  | 8.23   | Gas Asli / Disel<br><i>Natural Gas / Diesel</i>                          | 49,281.68  |
|     | Shah Alam, Selangor.                                      |  |  |  |
| 11  | <b>BASF Petronas Chemicals Sdn. Bhd.</b>                  | 27.40  | Gas Asli<br><i>Natural Gas</i>   | n/a  |
|     | Kuantan, Pahang   |  |  |  |
| 12  | <b>Nibong Tebal Paper Mill Sdn. Bhd.</b>                  | 0.80   | Habuk Kayu<br><i>Wood Waste</i>  | n/a  |
|     | Nibong Tebal Pulau Pinang.                                |  |  |  |

| No. | Pemegang Lesen & Lokasi<br>Licensee & Location    | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Bahan Api<br>Fuel Type  | Unit Penjanaan<br>(MWj)<br>Units Generated<br>(MWh) |
|-----|---|--|---|---|
| 13  | <b>Gas District Cooling (Putrajaya) Sdn. Bhd.</b> |  |   |   |
|     | Wilayah Persekutuan Putrajaya.                    | 10.74  | Gas Asli<br>Natural Gas   | 32,853.18   |
| 14  | <b>Petronas Penapisan (Melaka) Sdn. Bhd.</b>      |  |   |   |
|     | Sungai Udang, 76300 Melaka.                       | 145.00   | Gas Asli<br>Natural Gas   | 695,942.19  |
| 15  | <b>Gas District Cooling (Putrajaya) Sdn. Bhd.</b> |  |   |   |
|     | Putrajaya, 62000 Putrajaya.                       | 6.50   | Gas Asli<br>Natural Gas   | 43,809.80   |
| 16  | <b>Muda Paper Mills Sdn. Bhd.</b>                 |  |   |   |
|     | Hulu Langat, Selangor.                            | 14.40  | Gas Asli<br>Natural Gas   | 115,913.61  |
| 17  | <b>Ban Heng Bee Rice Mill (1952) Sdn. Bhd.</b>    |  |   |   |
|     | Pendang, Kedah.                                   | 0.54   | Bahan Buangan<br>Pertanian<br>Agricultural Waste                        | 1,402.13  |
| 18  | <b>Petronas Fertilizer (Kedah) Sdn. Bhd.</b>      |  |   |   |
|     | Kuala Muda, Kedah.                                | 18.31  | Gas Asli<br>Natural Gas   | n/a   |
| 19  | <b>Kilang Gula Felda Perlis Sdn. Bhd.</b>         |  |   |   |
|     | Chuping, Perlis.                                  | 9.43   | Gas Buangan Proses<br>Perindustrian<br>Industrial Process<br>Waste Heat | 25,677.45   |
| 20  | <b>Gula Padang Terap Sdn. Bhd.</b>                |  |   |   |
|     | Padang Terap, Kedah.                              | 10.29  | Bahan Buangan<br>Pertanian/ Disel<br>Agricultural Waste/<br>Diesel      | 24,499.32   |
| 21  | <b>Malayan Sugar Manufacturing Co. Bhd.</b>       |  |   |   |
|     | Perai, Pulau Pinang.                              | 8.95   | Gas Asli<br>Natural Gas   | n/a   |
| 22  | <b>Perak-Hanjoong Simen Sdn. Bhd.</b>             |  |   |   |
|     | Kuala Kangsar, Perak                              | 12.00  | Gas Buangan Proses<br>Perindustrian<br>Industrial Process<br>Waste Heat | n/a   |
| 23  | <b>PETRONAS GAS BERHAD (GPP A)</b>                |  |   |   |
|     | Kemaman, Terengganu                               | 25.00  | Gas Asli<br>Natural Gas   | n/a   |
| 24  | <b>PETRONAS GAS BERHAD (GPP B)</b>                |  |   |   |
|     | Dungun, Terengganu                                | 25.00  | Gas Asli<br>Natural Gas   | n/a   |
| 25  | <b>WRP Asia Pacific</b>                           |  |   |   |
|     | Sepang, Selangor                                  | 8.00   | Gas Asli<br>Natural Gas   | n/a   |

Nota | Note :

n/a Tiada maklumat | Not available

## Penjanaan Persendirian Kurang daripada 5 MW

### Self-Generation Less than 5 MW

**Jadual 12: Kapasiti Berlesen dan Unit Penjanaan**  
 Table 12: Licensed Capacity and Units Generated

| Jenis Bahan Api<br>Fuel Type | Sektor   Sector                              | 2008 | 2009  | 2010  | 2011  | 2012  |
|------------------------------|--|------|-------|-------|-------|-------|
|                              | Bilangan Lesen   Number of Licences          | 765  | 779   | 795   | 1,116 | 1,371 |
| Gas                          | Kapasiti Berlesen   Licensed Capacity (MW)   | 13   | 3     | 30    | 31    | 31    |
|                              | Unit Penjanaan (MWj)   Units Generated (GWh) | n/a  | 16    | 34    | 27    | 53    |
| Disel<br>Diesel              | Kapasiti Berlesen   Licensed Capacity (MW)   | 359  | 394   | 378   | 516   | 577   |
|                              | Unit Penjanaan (MWj)   Units Generated (GWh) | 26   | 811   | 640   | 723   | 339   |
| Sisa Sawit<br>Palm Oil Waste | Kapasiti Berlesen   Licensed Capacity (MW)   | 319  | 315   | 253   | 358   | 354   |
|                              | Unit Penjanaan (MWj)   Units Generated (GWh) | 21   | 707   | 614   | 730   | 526   |
| Lain-lain<br>Others          | Kapasiti Berlesen   Licensed Capacity (MW)   | 34   | 27    | 29    | 29    | 16    |
|                              | Unit Penjanaan (MWj)   Units Generated (GWh) | n/a  | 7     | 5     | 6     | 69    |
| Jumlah<br>Total              | Kapasiti Berlesen   Licensed Capacity (MW)   | 725  | 739   | 691   | 933   | 979   |
|                              | Unit Penjanaan (MWj)   Units Generated (GWh) | 47   | 1,542 | 1,293 | 1,486 | 987   |

Nota | Note :

Lain-lain termasuk lain-lain jenis biojisim (Hampas Padi, Hampas Tebu, Habuk Kayu, Cip Kayu) dan Biogas  
 Others including other types of biomass (Paddy Husk, Bagasse, Wood Dust, Wood Chips) and Biogas

## Senarai Pengagih-Pengagih Elektrik

### List of Electricity Distributors

Jadual 13: Senarai Pengagih-Pengagih Elektrik  
Table 13: List of Electricity Distributors

| No.   | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply   | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|---|--|---|---|--|
| <b>Gas District Cooling (KLIA) Sdn. Bhd.</b>      |  |   |   |  |
| 1   | Jalan KLIA S5 (KLIA Selatan), Southern Support Zone<br>64000 KLIA, Sepang, Selangor.<br>Tel : 03-8787 4326 Faks : 03-8787 4282   | Kuala Lumpur International Airport<br>Daerah Sepang<br>Selangor.  | 60.00                                       | 01-01-1996   |
| <b>Lembaga Pelabuhan Kelang</b>                   |  |   |   |  |
| 2   | Beg Berkunci 202, Jalan Pelabuhan Utara<br>42005 Pelabuhan Kelang, Selangor.<br>Tel : 03-3168 8211 Faks : 03-3167 0211 / 3168 9117   | Kelang Port Authority Premis<br>Jalan Pelabuhan<br>42005 Port Klang<br>Selangor.                              | 5.80  | 25-03-1997   |
| <b>Pangkalan Bekalan Kemaman Sdn. Bhd.</b>        |  |   |   |  |
| 3   | P.O. Box 64, Kemaman Supply Base<br>24007 Kemaman, Terengganu.<br>Tel : 09-863 1566 Faks : 09-863 1716   | Kawasan Pangkalan Bekalan<br>Kemaman<br>Kemaman<br>Terengganu.  | 3.31  | 01-12-1997   |
| <b>Malaysia Airports (Sepang) Sdn. Bhd.</b>       |  |   |   |  |
| 4   | 3 <sup>rd</sup> & 4 <sup>th</sup> Floor, Airport Management Centre<br>KL International Airport, 64000 KLIA, Selangor.<br>Tel : 03-8776 2000 Faks : 03-8926 5510 / 8926 5209                          | PT 13, PT 89, PT 39<br>Bandar Lapangan Terbang<br>Antarabangsa Sepang<br>Daerah Sepang<br>Selangor.           | 120.00                                      | 14-02-1998   |
| <b>Petronas Gas Bhd.</b>                          |  |   |   |  |
| 5   | Centralized Utility Facilities (CUF)<br>Integrated Petrochemical Complex, KM 106<br>Jalan Kuantan/K. Terengganu, 24300 Kertih, Kemaman,<br>Terengganu.<br>Tel : 09-830 5500 Faks : 09-830 5514       | Petrochemical Complex<br>Kerteh Industrial Area<br>Terengganu.  | 210.00                                      | 28-05-1998   |
| <b>Petronas Gas Bhd.</b>                          |  |   |   |  |
| 6   | Centralized Utility Facilities(CUF)<br>Integrated Petrochemical Complex, Lot 139A<br>Gebeng Industrial Area, Phase III, 26080 Kuantan,<br>Pahang.<br>Tel : 09-586 3300 Faks : 09-586 3311 / 586 3328 | Petrochemical Complex<br>Gebeng Industrial Area<br>Pahang.  | 105.00                                      | 28-05-1998   |
| <b>NUR Distribution Sdn. Bhd.</b>                 |  |   |   |  |
| 7   | Central Control Building (CCB), Lot 30, Jalan Hi-Tech 4<br>Kulim Hi-Tech Park, 09000 Kulim, Kedah.<br>Tel : 04-401 0100 Faks : 04-401 0344 / 401 0319  | Kulim Hi-Tech Industrial Park<br>Kedah.   | 440.00                                      | 17-09-1998   |
| <b>Gas District Cooling (KLCC) Sdn. Bhd.</b>      |  |   |   |  |
| 8   | Level 1, Bangunan DCCI<br>Persiaran KLCC Off Jalan Ampang,<br>50088 Kuala Lumpur.<br>Tel : 03-2380 5660 Faks : 03-2381 7086  | Bangunan DCC 1 / DCC 2<br>KLCC DCS/Co-Generation Plant<br>Persiaran KLCC, Jalan Ampang<br>50088 Kuala Lumpur. | 40.00                                       | 30-08-2000   |
| <b>Genting Utilities &amp; Services Sdn. Bhd.</b> |  |   |   |  |
| 9   | Tingkat 24, Wisma Genting, 28 Jalan Sultan Ismail<br>50250 Kuala Lumpur.<br>Tel : 03-2333 2288 / 6105 2637<br>Faks : 03-2333 3158 / 6015 2600  | Kawasan Genting Highlands<br>Negeri Pahang/Selangor.  | 48.00                                       | 17-10-2000   |

| No.   | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|---|---|---|--|---|
| <b>Ikano Corporation Sdn. Bhd.</b>                |   |   |  |   |
| 10  | No. 2, Jalan PJU 7/2, Mutiara Damansara 47800 Petaling Jaya, Selangor.<br>Tel : 03-7720 7350 Faks : 03-7726 6277                              | Lot PT 400038 Mutiara Damansara 47800 Petaling Jaya Selangor.   | 7.94   | 23-12-2003  |
| <b>Jaya Jusco Stores Berhad</b>                   |   |   |  |   |
| 11  | Jusco Taman Universiti Shopping Centre No. 4, Jalan Pendidikan, Taman Universiti 81300 Skudai, Johor.<br>Tel : 07-520 8700 Faks : 07-521 3000 | PTD 62861, Jalan Pendidikan Taman Universiti Mukim Pulau, Daerah Johor Bahru Johor.                           | 3.11   | 28-02-2004  |
| <b>Institute Of Technology Petronas Sdn. Bhd.</b> |   |   |  |   |
| 12  | Bandar Seri Iskandar, 31750 Tronoh, Perak.<br>Tel : 05-368 8000 Faks : 05-365 4075  | Kampus Universiti Teknologi Petronas, Tronoh, Perak.  | 8.40   | 26-01-2006  |
| <b>Eng Lian Enterprise Sdn. Bhd.</b>              |   |   |  |   |
| 13  | 9 Jalan Ampang #05-00, 50450 Kuala Lumpur.<br>Tel : 03-2056 0600 Faks : 03-2056 0700  | Lot 51533 Mukim Kuala Lumpur Kuala Lumpur.  | 2.29   | 01-03-2006  |
| <b>AEON Co. (M) Bhd.</b>                          |   |   |  |   |
| 14  | Jusco Metro Prima Shopping Centre, 1st. Floor No. 1, Jalan Metro Prima, 52100 Kepong, Kuala Lumpur.<br>Tel : 03-6259 1122 Faks : 03-6259 2805 | PT 20954 Mukim Batu Kuala Lumpur.   | 4.83   | 15-03-2006  |
| <b>Fawanis Sdn. Bhd.</b>                          |   |   |  |   |
| 15  | 13 <sup>th</sup> Floor, Wisma Denmark 86, Jalan Ampang, 50450 Kuala Lumpur.<br>Tel : 03-2032 2111 Faks : 03-2078 4679                         | Queen's Park Retail Centre Lot 392, Batu 2 - 2 1/2 Jalan Cheras Kuala Lumpur.                                 | 0.94   | 11-05-2006  |
| <b>Malakoff Utilities Sdn. Bhd.</b>               |   |   |  |   |
| 16  | Suite 4-G-A, Ground Floor, Block 4 Plaza Sentral, Jalan Stesen Sentral 5, 50470 Kuala Lumpur.<br>Tel : 03-2263 3388 Faks : 03-2263 3366       | Kawasan Pembangunan Kuala Lumpur Sentral Kuala Lumpur.  | 100.00   | 15-10-2006  |
| <b>Sunway Carnival Sdn. Bhd.</b>                  |   |   |  |   |
| 17  | No. 1, Persiaran Mahsuri 1/3, Sunway Tunas 11900 Bayan Lepas, Pulau Pinang.<br>Tel : 04-643 9898 Faks : 04-644 1313                           | Lot 5497, 5498 dan 5499 Daerah Seberang Perai Tengah Pulau Pinang.  | 5.00   | 01-11-2006  |
| <b>ASM Properties Sdn. Bhd.</b>                   |   |   |  |   |
| 18  | Suite 5.4, Level 5, Maju Junction Mall 1001 Jalan Sultan Ismail, 50250 Kuala Lumpur.<br>Tel : 03-2772 8500 Faks : 03-2772 8501                | Maju Junction Mall Lot PT 19 Seksyen 46 Kuala Lumpur.   | 10.80  | 24-11-2006  |
| <b>Lembaga Tabung Haji</b>                        |   |   |  |   |
| 19  | Tingkat 7, Bangunan TH Perdana 1001, Jalan Sultan Ismail, 50250 Kuala Lumpur.<br>Tel : 03-2781 9020 Faks : 03-2781 9023                       | Menara TH Perdana Lot 101 Mukim Kuala Lumpur Kuala Lumpur.  | 3.00   | 29-12-2006  |
| <b>Aeon Co. (M) Bhd.</b>                          |   |   |  |   |
| 20  | AEON Cheras Selatan Shopping Centre Aras 1, Lebuhr Tun Hussien Onn, 43200 Balakong, Selangor.<br>Tel : 03-9080 3498 Faks : 03-9080 3598       | AEON Cheras Selatan Shopping Centre PT 41977 (Sebahagian Lot 2225) Mukim Cheras, Daerah Hulu Langat Selangor. | 8.16   | 05-02-2007  |

| No.  | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply  | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|--|--|--|---|--|
| <b>Urusharta Cemerlang Sdn. Bhd.</b>           |  |  |   |  |
| 21   | Level 10 Pavilion Kuala Lumpur, 168, Jalan Bukit Bintang<br>55100 Kuala Lumpur.<br>Tel : 03-2118 8888 / 2118 8880<br>Faks : 03-2118 8889 / 2118 8911 | Pavilion Kuala Lumpur<br>Lot 174, 185, 187, 188, 281, (Lot Baru : 332) dan 260<br>Jalan Bukit Bintang/Jalan Raja Chulan, Seksyen 67<br>Kuala Lumpur.   | 22.10                                       | 14-03-2007   |
| <b>AEON Co. (M) Bhd.</b>                       |  |  |   |  |
| 22   | Jusco Seremban 2 Shopping Centre<br>112, Persiaran S2 B1, Seremban 2<br>70300 Seremban, Negeri Sembilan.<br>Tel : 06-601 5618 Faks : 06-601 5645     | AEON Seremban 2<br>Lot PT 10787 HS(D) 97966 & PT 10790 HS(D) 97969<br>Mukim Rasah<br>Daerah Seremban<br>Negeri Sembilan.   | 7.05  | 30-03-2007   |
| <b>Mid Valley City Energy Sdn. Bhd.</b>        |  |  |   |  |
| 23   | Level 32, The Gardens South Tower Mid Valley City<br>Lingkar Syed Putra, 59200 Kuala Lumpur.<br>Tel : 03-2289 8989 Faks : 03-2938 3230 / 2289 8981   | The Gardens (Phase 2)<br>Lot PT13, Mukim Kuala Lumpur<br>Daerah Kuala Lumpur<br>59200 Wilayah Persekutuan.   | 55.00                                       | 03-05-2007   |
| <b>Bandar Utama City Corporation Sdn. Bhd.</b> |  |  |   |  |
| 24   | 1, Persiaran Bandar Utama<br>Bandar Utama<br>47800 Petaling Jaya<br>Selangor.<br>Tel : 03-7728 8878 Faks : 03-7728 9978                              | Kawasan Pembangunan Bandar Utama<br>Lot PT 37649, 37650, 17970-17974, 17976 dan 15366,<br>Mukim Sungai Buloh, PT 18 dan 17968 Bandar Petaling Jaya dan PT 22, 23, 44, 45, 83, Lot 27657-27659, 27962, 27669, 27671, 27673-27676, 27679, 27680<br>Seksyen 39, Bandar Petaling Jaya,<br>Daerah Petaling<br>47800 Selangor. | 100.00                                      | 10-05-2007   |
| <b>Fusion Energy Sdn. Bhd.</b>                 |  |  |   |  |
| 25   | Lot 2319, Kaw. Perindustrian Olak Lempit<br>Mukim Tanjung 12, 42700 Banting<br>Selangor.<br>Tel : 03-3182 2000 Faks : 03- 3182 2382 / 3182 2279      | Lion Group Complex<br>Lot 2319, 2320, 2321, 2323, 2582, 2823, dan 2824<br>Mukim Tanjung Dua Belas<br>Daerah Kuala Langat<br>42700 Selangor.  | 418.00                                      | 12-06-2007   |
| <b>Eng Lian Enterprise Sdn. Bhd.</b>           |  |  |   |  |
| 26   | 9 Jalan Ampang #05-00<br>50450 Kuala Lumpur.<br>Tel : 03-2056 0600 Faks : 03-2056 0700   | Bangsar Village II<br>Lot 43872, 43873 dan 43874<br>Mukim Kuala Lumpur,<br>Daerah Kuala Lumpur<br>59100 Wilayah Persekutuan.   | 3.12  | 03-09-2007   |
| <b>Y.S. Tang Holdings Sdn. Bhd.</b>            |  |  |   |  |
| 27   | 1-888, KB Mall, Jalan Hamzah<br>15050 Kota Bharu, Kelantan.<br>Tel : 09-747 6622 Faks : 09-747 5900  | KB Mall, PT 101, Jalan Hamzah<br>Seksyen 16<br>Bandar Kota Bharu<br>15050 Kelantan.  | 3.16  | 18-09-2007   |
| <b>Jurus Kota Sdn. Bhd.</b>                    |  |  |   |  |
| 28   | 2-888, M-Floor, Alor Star Mall<br>Kawasan Perusahaan Tandop Baru, 05400 Alor Star,<br>Kedah.<br>Tel : 04-772 9233 Faks : 04-771 2033                 | Alor Star Mall, Lot 801 & 802<br>Dalam Kawasan Perniagaan Dan Industri<br>Kecil Sri Tandop 1, Mukim Pengkalan Kundor<br>Daerah Kota Setar, Kedah.  | 3.59  | 18-09-2007   |

| No.   | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|---|---|---|--|---|
| <b>Astral Realty Sdn. Bhd.</b>              |   |   |  |   |
| 29  | East Coast Mall, Level 3, Jalan Putra Square 6<br>Putra Square, 25200 Kuantan, Pahang.<br>Tel : 09-560 9595 Faks : 09-560 9597  | PUTRA Square<br>Lot 423 (PN 5596)<br>Mukim Kuantan, 25000 Kuantan<br>Pahang.  | 4.79   | 10-10-2007  |
| <b>C.S. Khin Developments Sdn. Bhd.</b>     |   |   |  |   |
| 30  | 6 <sup>th</sup> Floor, Wisma Mirama<br>Jalan Wisma Putra, 50460 Kuala Lumpur.<br>Tel : 03-2142 1666 Faks : 03-2148 1229   | Wisma Mirama<br>Lot 888, Section 69<br>50460 Kuala Lumpur<br>Wilayah Persekutuan.   | 0.85   | 10-10-2007  |
| <b>Wisma Central Management Corporation</b> |   |   |  |   |
| 31  | Lot 2.142, 1 <sup>st</sup> Floor, Wisma Central<br>Jalan Ampang, Box #198, 50450 Kuala Lumpur.<br>Tel : 03-2161 7522 Faks : 03-2161 9721                                    | Wisma Central<br>Geran 10015, Lot 150<br>Seksyen 58, Bandar Kuala Lumpur<br>50450 Wilayah Persekutuan.                              | 2.20   | 31-10-2007  |
| <b>AEON Co. (M) Bhd.</b>                    |   |   |  |   |
| 32  | AEON Bukit Tinggi Shopping Centre<br>Level 1, No. 1, Persiaran Batu Nilam 1/KS 6<br>Bandar Bukit Tinggi 2, 41200 Klang, Selangor.<br>Tel : 03-3326 2370 Faks : 03-3326 2371 | AEON Co. (M) Bhd. Mall<br>Lot PT 2042 HS(D) 105957 dan PT<br>2043 HS(D) 105958<br>Mukim Klang<br>Daerah Klang<br>Selangor.          | 12.00  | 11-12-2007  |
| <b>Tradewinds Properties Sdn. Bhd.</b>      |   |   |  |   |
| 33  | 21 <sup>st</sup> Floor, Wisma Zelan<br>No. 1, Jalan Tasik Permaisuri 2<br>Bandar Tun Razak, Cheras, 56000 Kuala Lumpur.<br>Tel : 03-9106 3166 Faks : 03 9106 3177           | Kompleks Antarabangsa<br>Lot 1158, Seksyen 57<br>Mukim Bandar Kuala Lumpur<br>Daerah Kuala Lumpur<br>50250 Wilayah Persekutuan.     | 4.97   | 11-12-2007  |
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>      |   |   |  |   |
| 34  | Giant Hypermarket Kuala Terengganu<br>Complex Division, Lot PT 1485, Jalan Padang Hiliran<br>21100 Kuala Terengganu, Terengganu.<br>Tel : 09-631 9220 Faks : 09-631 9230    | GCH Retail (Malaysia) Sdn. Bhd.<br>Mall<br>HS(D) 5917, PT 1485<br>Mukim Cabang Tiga<br>Daerah Kuala Terengganu<br>21100 Terengganu. | 3.30   | 09-01-2008  |
| <b>Awona Land Sdn. Bhd.</b>                 |   |   |  |   |
| 35  | Suite 4.09.03, 4 <sup>th</sup> Floor, Central Square<br>No. 23, Jalan Kampung Baru, 08000 Sungai Petani,<br>Kedah.<br>Tel : 04-421 2268 / 423 8288 Faks : 04-422 4552       | Central Square Shopping Centre<br>Lot 134 HS(D) 759/95<br>Mukim Sungai Petani<br>Daerah Kuala Muda<br>08000 Kedah.                  | 4.10   | 14-03-2008  |
| <b>AEON Co. (M) Bhd.</b>                    |   |   |  |   |
| 36  | Kinta City Shopping Centre<br>No. 2, Jalan Teh Lean Swee<br>Off Jalan Sultan Azlan Shah Utara, 31400 Ipoh, Perak.<br>Tel : 05-548 4668 / 545 0913 Faks : 05-546 0899        | AEON Kinta City Shopping Centre<br>Lot 51150<br>Mukim Ulu Kinta<br>Daerah Kinta, 31400 Ipoh<br>Perak.                               | 7.65   | 18-03-2008  |
| <b>Menara Hap Seng Sdn. Bhd.</b>            |   |   |  |   |
| 37  | 19 <sup>th</sup> Floor, Menara Hap Seng<br>Letter Box No. 83, Jalan P. Ramlee<br>50250 Kuala Lumpur.<br>Tel : 03-2145 1363 / 2145 9363 Faks : 03-2145 7818                  | Menara Hap Seng<br>Lot 593 & 594<br>Mukim Bandar Kuala Lumpur<br>Daerah Kuala Lumpur<br>50250 Kuala Lumpur<br>Wilayah Persekutuan.  | 4.82   | 19-03-2008  |



| No. | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address   | Kawasan Bekalan<br>Area of Supply  | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|-----|---|--|---|--|
| 38  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |  |   |  |
|     | Giant Hypermarket Kuantan, Lot 5197<br>Jalan Tanah Putih, Seksyen 124, 25150 Kuantan,<br>Pahang.<br>Tel : 09-515 6999 Faks : 09-515 6466  | Lot 5197<br>Mukim Kuantan<br>Daerah Kuantan<br>25100 Pahang.   | 2.96  | 10-04-2008   |
| 39  | <b>AEON Co. (M) Bhd.</b>  |  |   |  |
|     | Aeon Seberang Prai City Shopping Centre<br>Management Office, 1 <sup>st</sup> Floor<br>Perdana Mall, Jalan Perda Timur<br>14000 Bukit Mertajam, Seberang Prai Tengah<br>Pulau Pinang.<br>Tel : 04-537 8022 Faks : 04-537 9022 | Lot H.S.(M): 378 / PT 802<br>Mukim 6 & 7<br>Seberang Perai Tengah<br>14000 Pulau Pinang.             | 14.00                                       | 28-04-2008   |
| 40  | <b>Malaysia Airline System Berhad</b>   |  |   |  |
|     | 3 <sup>rd</sup> Floor, Administration Building 1<br>MAS Complex A, Sultan Abdul Aziz Shah Airport<br>47200 Subang, Selangor.<br>Tel : 03-7843 3000 Faks : 03-8783 3089  | Kompleks Kampus MAS<br>Lot PT 19<br>Mukim Dengkil<br>Daerah Sepang<br>64000 Selangor.                | 25.00                                       | 29-04-2008   |
| 41  | <b>Amtrustee Berhad</b>   |  |   |  |
|     | Hektar Premier Sdn. Bhd. Lot F36, First Floor<br>Subang Parade<br>No. 5, Jalan SS 16/1, 47500 Subang Jaya, Selangor.<br>Tel : 03-5032 9778 / 5633 2530 Faks : 03-5633 8079  | Subang Parade<br>Lot 14193,<br>Mukim Bandar Subang Jaya<br>Daerah Petaling<br>47500 Selangor.        | 10.00                                       | 07-05-2008   |
| 42  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |  |   |  |
|     | Giant Superstore Ulu Klang - Complex Division<br>Lot 13793 & 13796, Jalan Changkat Permata<br>Taman Permata, 53300 Kuala Lumpur.<br>Tel : 03-4106 2275 / 4105 3194 Faks : 03-4106 7414  | Lot 13793 dan 13796<br>Mukim Setapak<br>Daerah Gombak<br>53300 Selangor.                             | 2.68  | 20-05-2008   |
| 43  | <b>Reliable Capacity Sdn. Bhd.</b>  |  |   |  |
|     | G-M-1, Axis Atrium @ Axis Pandan<br>Jalan Cempaka, Taman Cempaka, 68000 Ampang,<br>Selangor.<br>Tel : 03-9281 2307 Faks : 03-9281 2305  | Parcel 1 Perdagangan 'Axis Atrium'<br>No. Lot 27985, Mukim Ampang<br>Daerah Hulu Langat<br>Selangor. | 3.60  | 13-06-2008   |
| 44  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |  |   |  |
|     | (Complex Management Division - Giant Tampoi)<br>Lot 54, Jalan Skudai, 81200 Tampoi, Johor Bahru, Johor.<br>Tel : 07-238 2353 Faks : 07-238 2354   | Lot 54, Mukim Tampoi<br>Daerah Johor Bahru<br>81200 Johor.   | 5.10  | 08-07-2008   |
| 45  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |  |   |  |
|     | (Complex Division - Plentong)<br>3 Jalan Masai Lama, Mukim Plentong,<br>81750 Johor Bahru.<br>Tel : 07-358 1402 Faks : 07-352 6532  | Lot P.T.D. 116058 dan 116059<br>Mukim Plentong<br>Daerah Johor Bahru<br>Johor.                       | 4.20  | 17-07-2008   |
| 46  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |  |   |  |
|     | Giant Hypermarket Skudai, Lot 3066 & 3067<br>Mukim Tebrau, 81200 Johor Bahru, Johor.<br>Tel : 07-554 7233 Faks : 07-554 7229  | Lot 3066 & 3067<br>Mukim Tebrau<br>Daerah Johor Bahru<br>81200 Johor.                                | 3.70  | 12-08-2008   |
| 47  | <b>Panglobal Insurance Bhd.</b>   |  |   |  |
|     | (PanGlobal Marketing Berhad)<br>Suite 34.01, Level 34, Menara KH<br>Jalan Sultan Ismail, 50250 Kuala Lumpur.<br>Tel : 03-2141 1010 Faks : 03-2141 5103  | PanGlobal Building<br>Lot 53 Section 20<br>Bandar Petaling Jaya<br>Daerah Petaling Jaya<br>Selangor. | 1.70  | 24-10-2008   |

| No. | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|-----|---|---|--|---|
| 48  | <b>Lianbang Ventures Sdn. Bhd.</b>  |   |  |   |
|     | F4-40, Level 4, Dataran Pahlawan Melaka Megamall Jalan Merdeka, 75000 Bandar Hilir, Melaka.<br>Tel : 06-282 1828 Faks : 06-283 1827   | Dataran Pahlawan Melaka Megamall Lot 14, 141 dan 142 Mukim Kawasan Bandar XXVII, Daerah Melaka Tengah Melaka.   | 5.52   | 29-10-2008  |
| 49  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |  |   |
|     | Giant Mall Kelana Jaya No. 33, Jalan SS 6/12 SS 6, Kelana Jaya, 47301 Petaling Jaya, Selangor.<br>Tel : 03-7880 4714 Faks : 03-7803 7858                                    | Giant Mall Kelana Jaya Lot PT 67 Seksyen 40 Mukim Bandar Petaling Jaya Daerah Petaling 47301 Selangor.  | 6.11   | 05-11-2008  |
| 50  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |  |   |
|     | Giant Hypermarket Shah Alam, Lot 2, Persiaran Sukan Seksyen 13, 40100 Shah Alam, Selangor.<br>Tel : 03-5544 8888 / 5511 8530 Faks : 03-5511 9681                            | Lot 2, Seksyen 13 Daerah Shah Alam Selangor.  | 4.20   | 05-11-2008  |
| 51  | <b>Tropicana City Sdn. Bhd.,<br/>(Formerly Known as Dijaya Land Sdn. Bhd.)</b>  |   |  |   |
|     | Management Office, Lot B1-01 Basement 1, Tropicana City Mall, No. 3 Jalan SS20/27 47400 Petaling Jaya, Selangor.<br>Tel : 03-7710 1818 Faks : 03-7710 0202                  | Tropicana City Lot 45821 Mukim Damansara Utama Daerah Petaling Jaya Selangor.   | 11.03  | 05-11-2008  |
| 52  | <b>BR Property Holdings Sdn. Bhd.</b>   |   |  |   |
|     | Lot No. T117A, 3 <sup>rd</sup> Floor, Bangsar Shopping Centre 285 Jalan Maarof, Bukit Bandaraya, 59000 Kuala Lumpur.<br>Tel : 03-2094 7700 Faks : 03-2094 1022              | Bangsar Shopping Centre Lot 41274 Daerah Kuala Lumpur Wilayah Persekutuan Kuala Lumpur.   | 8.51   | 18-11-2008  |
| 53  | <b>Dream Property Sdn. Bhd.</b>   |   |  |   |
|     | 2-12, 2 <sup>nd</sup> Floor, Batu Pahat Mall Jalan Kluang 83000 Batu Pahat, Johor.<br>Tel : 07-433 7733 Faks : 07-438 7773  | Batu Pahat Mall Lot 2566 Mukim Simpang Kanan Daerah Batu Pahat Johor.   | 7.35   | 18-11-2008  |
| 54  | <b>AEON Co. (M) Bhd.</b>  |   |  |   |
|     | AEON Bukit Indah Shopping Centre 1 <sup>st</sup> Floor, No. 8, Jalan Indah 15/2 Bukit Indah, 51200 Johor Bahru, Johor.<br>Tel : 07-2368 071 Faks : 07-2368 076              | Lot PTD 90606 Mukim Pulai Daerah Johor Bahru Johor.   | 8.00   | 26-11-2008  |
| 55  | <b>Tesco Stores (M) Sdn. Bhd.<br/>(Melaka Branch)</b>   |   |  |   |
|     | No. 1 Jalan Tun Abdul Razak Peringgit 74500 Melaka.<br>Tel : 06-288 3078 Faks : 06-288 2028   | Kompleks Perniagaan TESCO Lot 1 PT 1053 dan Lot 2 PT 1111 Mukim Peringgit Lot 3 PT2 Mukim Town Area XXXII dan Lot 4 PT70 Mukim Town AreaXXXIII Daerah Melaka Tengah 75400 Melaka. | 3.01   | 26-11-2008  |
| 56  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |  |   |
|     | Complex Management, Giant Hypermarket Klang Lot 83191 & 83192, Persiaran Batu Nilam Bandar Bukit Tinggi 1, 41200 Klang, Selangor.<br>Tel : 03-3323 5518 Faks : 03-3323 5863 | Lot PT 62366(HSD 63350), PT 62367(HSD 63351) dan PT 75234A (HSD 68651) Mukim Kelang, Daerah Kelang Selangor.  | 3.30   | 03-12-2008  |

| No.                                       | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply   | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|---|--|---|---|--|
| <b>Tanah Sutera Development Sdn. Bhd.</b> |  |   |   |  |
| 57  | No. 2, Jalan Sutera Merah 2<br>Taman Sutera<br>81200 Johor Bharu.<br>Tel : 07-289 9009 Faks : 07-289 9119  | Kompleks Perniagaan Sutera Mall<br>Lot Sebahagian PTD 67962<br>Mukim Pulau<br>Daerah Johor Bharu<br>Johor.  | 5.98  | 03-12-2008   |
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>    |  |   |   |  |
| 58  | Giant Hypermarket Senawang,<br>Lot 1571 Jalan Senawang<br>70450 Seremban, Negeri Sembilan.<br>Tel : 06-678 0719 / 678 0720 Faks : 06-678 2360  | Lot PT 1571 HS(D) 133690<br>Pekan Senawang<br>Daerah Seremban<br>Negeri Sembilan.   | 2.12  | 03-12-2008   |
| <b>Malaysia Airports Sdn. Bhd.</b>        |  |   |   |  |
| 59  | Lapangan Terbang Sultan Ismail Petra<br>16100 Kota Bharu<br>Kelantan.<br>Tel : 09-773 7400 Faks : 09-773 2852  | Kompleks Lapangan Terbang Sultan<br>Ismail Petra<br>Lot 833 (Sek 40),<br>Mukim Pengkalan Chepa<br>Dan Lot 2209 (Sek 39),<br>Mukim Baung<br>Daerah Kota Bharu<br>Kelantan. | 2.56  | 19-12-2008   |
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>    |  |   |   |  |
| 60  | Giant Hypermarket Southern City<br>Ground Floor, Southern City, No. 3, Jalan Suria 19<br>Taman Suria, 81100 Johor Bahru, Johor.<br>Tel : 07-334 7214 Faks: 07-334 6762   | Lot HS(D)247769 PTB 20274<br>Daerah Bandar Johor Bahru<br>Johor.  | 1.95  | 14-01-2009   |
| <b>Permodalan Nasional Berhad</b>         |  |   |   |  |
| 61  | 19 <sup>th</sup> Floor, Menara Tun Ismail Mohamed Ali<br>No. 25, Jalan Raja Laut, 50350 Kuala Lumpur.<br>Tel : 03-2694 2213 Faks : 03-2691 3791  | Menara Tun Ismail Mohamed Ali<br>Lot 1406<br>Mukim Bandar Kuala Lumpur<br>Wilayah Persekutuan Kuala Lumpur.   | 5.95  | 04-02-2009   |
| <b>AEON Co. (M) Bhd.</b>                  |  |   |   |  |
| 62  | Aeon AU2 (Setiawangsa) Shopping Centre, Setiawangsa<br>Lower Ground Floor, No. 6, Jalan Taman Setiawangsa<br>(Jalan 37/56)<br>AU2, Taman Keramat, 54200 Kuala Lumpur.<br>Tel : 03-4257 2533 Faks: 03-4257 2633 | Lot PT 1019 (HSD 83614)<br>Mukim Hulu Kelang<br>Wilayah Persekutuan Kuala Lumpur.   | 3.89  | 16-02-2009   |
| <b>Ivory Gleneary Sdn. Bhd.</b>           |  |   |   |  |
| 63  | 77-4B-1, Penang Times Square<br>Jalan Dato Keramat<br>10150 George Town<br>Penang.<br>Tel : 04-210 9020 Fax : 04-210 9021  | Penang Times Square<br>Lot 73, 96, 98, 101, 102, 145, 146,<br>150, 159, 160,<br>163, 278, 279, 735 hingga 753 dan<br>767<br>Seksyen 10, Georgetown<br>10150 Pulau Pinang. | 15.80                                       | 16-02-2009   |
| <b>Bronze Towers Sdn. Bhd.</b>            |  |   |   |  |
| 64  | No. B 60, First Floor, Lorong Tun Ismail 5<br>25000 Kuantan<br>Pahang.<br>Tel : 09-515 9303 Faks : 09-515 9304   | Plaza Kuantan<br>Lot PT 6727/12 dan PT 6727/13<br>Mukim Kuala Kuantan<br>Daerah Kuantan<br>Pahang.  | 2.50  | 16-02-2009   |
| <b>Magic Coast Sdn. Bhd.</b>              |  |   |   |  |
| 65  | No. 2-2, Jalan SS 6/6, Kelana Jaya<br>47301 Petaling Jaya, Selangor.<br>Tel : 03-7805 2022 Faks : 03-7804 7668   | Lot 582 Mukim Jalan Tun<br>Sambanthan<br>Seksyen 55, Daerah Kuala Lumpur<br>Negeri Persekutuan Kuala Lumpur.  | 13.00                                       | 23-02-2009   |

| No.   | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|---|---|---|--|---|
| <b>Floral E-Joy Sdn. Bhd.</b>                         |   |   |  |   |
| 66  | No : 36A (1 <sup>st</sup> Floor), Jalan Persiaran Flora Utama Taman Flora Utama, 83000 Batu Pahat, Johor.<br>Tel : 07-432 7899 Faks : 07-432 6899   | Square 1, Lot PTD 48031 Mukim Simpang Kanan Daerah Batu Pahat Johor.                                      | 1.99   | 25-02-2009  |
| <b>Legend Advance Sdn. Bhd.</b>                       |   |   |  |   |
| 67  | M - IOI, Jalan Alor Bukit Taman Legenda Putra 81000 Kulai, Johor.<br>Tel : 07-662 6101 Faks : 07-662 2510   | IOI Mart Lot 5592 - 5595 Mukim Senai Daerah Kulai Johor   | 0.92   | 12-03-2009  |
| <b>MSL Properties Sdn. Bhd.</b>                       |   |   |  |   |
| 68  | Wangsa Walk Mall Management Office, Lot G93A Wangsa Walk Mall, Wangsa Avenue, 9, Jalan Wangsa Perdana 1 Bandar Wangsa Maju, 53300 Kuala Lumpur.<br>Tel : 03-4142 8888 Faks : 03-4149 7441 | Wangsa Walk Mall Lot PT 8282 (HSD 111811) Mukim Setapak Daerah Kuala Lumpur Wilayah Persekutuan.          | 8.63   | 20-03-2009  |
| <b>Salak Park Sdn. Bhd.</b>                           |   |   |  |   |
| 69  | No. 3-1-1, Block A Megan Salak Park, Jalan 2/125E Taman Desa Petaling, 57100 Kuala Lumpur.<br>Tel : 03-9057 5733 Faks : 03-9058 7481  | Lot No. 38606 and 38603 Taman Desa Petaling Mukim Petaling Daerah Wilayah Persekutuan 57100 Kuala Lumpur. | 2.27   | 27-04-2009  |
| <b>Tenaga Nusantara Sdn. Bhd.</b>                     |   |   |  |   |
| 70  | Lot 2-18, 2 <sup>nd</sup> Floor, Kluang Mall, Jalan Rambutan Bandar Kluang, 86000 Kluang, Johor.<br>Tel : 07-776 1240 Faks : 07-776 1202  | Lot 6113 Mukim Bandar Kluang Daerah Kluang 86000 Johor.   | 4.50   | 13-05-2009  |
| <b>Technology Park Malaysia Corporation Sdn. Bhd.</b> |   |   |  |   |
| 71  | Level 5, Enterprise 4, Lebuhraya Puchong - Sg. Besi Bukit Jalil, 57000 Kuala Lumpur.<br>Tel : 03-8998 2260 Faks : 03-8998 2226  | Taman Teknologi Malaysia Lot PT 5517, Mukim Petaling Daerah Kuala Lumpur Wilayah Persekutuan.             | 4.65   | 18-05-2009  |
| <b>1<sup>st</sup> Avenue Mall Sdn. Bhd.</b>           |   |   |  |   |
| 72  | Centre Management Office, 5 <sup>th</sup> Floor, 1 <sup>st</sup> Avenue 182, Jalan Magazine, 10300 Penang.<br>Tel : 04-261 1121 Faks : 04-263 1121  | Lot 386 Mukim Seksyen 17 Daerah Georgetown Pulau Pinang.  | 6.08   | 22-05-2009  |
| <b>Mydin Mohamed Holdings Bhd.</b>                    |   |   |  |   |
| 73  | Mydin HQ Lot 675 & 676, Persiaran Subang Permai, Off Jalan SS13/1K 47500 Subang Jaya, Selangor.<br>Tel : 03-8073 6000 Faks : 03-8073 6388   | MYDIN Wholesale Hypermarket Lot 675 & 676 Mukim Damansara Daerah Petaling Jaya Selangor.                  | 5.62   | 02-06-2009  |
| <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>              |   |   |  |   |
| 74  | TESCO Seri Alam Lot PTD 111515, Jalan Seri Alam, Bandar Seri Alam 81750 Masai, Johor.<br>Tel : 07-388 5164 Faks : 07-388 6709   | TESCO Seri Alam Lot PTD 111515 Mukim Plentong Daerah Johor Bharu Johor.                                   | 3.40   | 16-06-2009  |

| No. | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply  | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|-----|--|--|---|--|
|     | <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>   |  |   |  |
| 75  | No.3 Jalan Batu Nilam 6/ks6, Bandar Bukit Tinggi<br>41200 Klang, Selangor.<br>Tel : 03-3323 1100 Faks : 03-3323 8802                                     | TESCO Kelang<br>Lot 83595, Mukim Pekan<br>Pandamaran<br>Daerah Kelang<br>Selangor.   | 3.40  | 16-06-2009   |
|     | <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>   |  |   |  |
| 76  | 148-149 Pusat Bandar Puchong<br>Jalan Bandar 3, Off Jalan Puchong<br>47100 Puchong, Selangor.<br>Tel : 03-8076 2166 Faks : 03-8076 1525                  | TESCO Puchong<br>Lot PT 2, Mukim Pekan Desa<br>Puchong<br>Daerah Petaling<br>Selangor.   | 3.40  | 16-06-2009   |
|     | <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>   |  |   |  |
| 77  | TESCO Ipoh<br>No. 2, Jalan Jambu, Taman Teh Teng Seng<br>31400 Ipoh, Perak.<br>Tel : 05-546 3352 Faks : 05-548 4159                                      | TESCO Ipoh<br>Lot PT 217003<br>Mukim Hulu Kinta<br>Daerah Kinta<br>Perak.  | 3.40  | 16-06-2009   |
|     | <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>   |  |   |  |
| 78  | Lot PT 37820 & 11196<br>Mukim Kajang Saujana Impian<br>43000 Kajang<br>Selangor.<br>Tel : 03-8734 1369 Faks : 03-8734 1297                               | TESCO Kajang<br>Lot PT 37820, Mukim Kajang dan<br>Lot PT 66452 & 44628<br>Seksyen 9, Mukim Bandar Kajang<br>Daerah Ulu Langat<br>Selangor. | 3.40  | 16-06-2009   |
|     | <b>Kumpulan Wang Simpanan Pekerja</b>  |  |   |  |
| 79  | Jabatan Pengurusan Harta, Tingkat 14, Bangunan KWSP<br>Jalan Raja Laut, 50350 Kuala Lumpur.<br>Tel : 03-2616 2269 Faks : 03-2693 8704                    | Lot PT 144258<br>Bandar Ipoh<br>Daerah Kinta<br>Perak.   | 2.44  | 16-06-2009   |
|     | <b>See Sen Chemical Bhd.</b>   |  |   |  |
| 80  | PT 3940, Kawasan Perindustrian Teluk Kalong<br>24000 Kemaman, Terengganu.<br>Tel : 09-863 2142 / 863 2304 Faks : 09-863 2143                             | Malay-Sino Chemical Industries Sdn.<br>Bhd.<br>Lot 2989, 3558, 3557 dan 4524<br>Mukim Teluk Kalong, Daerah<br>Kemaman<br>Terengganu.       | 6.00  | 17-06-2009   |
|     | <b>Crest Worldwide Resources Sdn. Bhd.</b>   |  |   |  |
| 81  | Wisma SKN, No. 5, Persiaran Lidco 1<br>Off Jalan Yap Kwan Seng, 50450 Kuala Lumpur.<br>Tel : 03-2162 1929 Faks : 03-2162 0929                            | Lot 134, PT 32, Seksyen 44<br>Mukim Bandar Kuala Lumpur<br>Daerah Kuala Lumpur<br>Wilayah Persekutuan.                                     | 7.00  | 17-06-2009   |
|     | <b>Westports Malaysia Sdn. Bhd.</b>  |  |   |  |
| 82  | P.O. Box 266<br>Pulau Indah, 42009 Port Klang.<br>Tel : 03-3169 4000 Faks : 03-3169 4101   | Lot PT 65746<br>Mukim Klang, Daerah Klang<br>Selangor.   | 83.00                                       | 26-06-2009   |
|     | <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>   |  |   |  |
| 83  | TESCO Extra Ipoh<br>No. 2, Laluan Tasek Timur 6, Perak.<br>Taman Tasek Indra, Off Jalan Kg. Bercham, 31400 Ipoh.<br>Tel : 05-546 3352 Faks : 05-548 4159 | TESCO Extra Ipoh<br>Lot PT 128421<br>Mukim Hulu Kinta<br>Daerah Kinta<br>Perak.  | 2.76  | 02-07-2009   |

| No.                                       | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>   | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|---|---|--|--|---|
| <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>  |   |  |  |   |
| 84  | Ground Floor, AIM Point Plaza<br>Jalan Emas 15<br>Bandar Sungai Emas<br>42700 Banting, Selangor.<br>Tel : 03-3187 2909 Faks : 03-3187 2141                                    | TESCO Banting<br>Ground Floor, AIM Point Plaza<br>Bandar Sungai Emas<br>Mukim Tanjung Dua Belas<br>42700 Banting, Kuala Langat<br>Selangor.          | 1.30   | 02-07-2009  |
| <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>  |   |  |  |   |
| 85  | TESCO Extra Sungai Dua<br>No. 657, Jalan Sg Dua, Pulau Pinang.<br>11700 Sungai Dua<br>Tel : 04-656 9888 Faks : 04-659 1188  | TESCO Extra Sungai Dua<br>Lot 10252, Mukim 13<br>Daerah Timur Laut (DTL)<br>Jalan Sungai Dua<br>Pulau Pinang.  | 1.70   | 02-07-2009  |
| <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>  |   |  |  |   |
| 86  | No 1, Persiaran Sukan, Peti Surat 7427<br>Seksyen 13, 40714 Shah Alam, Selangor.<br>Tel : 03-5512 2600 Faks : 03-5510 2305  | TESCO Extra Shah Alam<br>Lot 1107, Mukim Bandar Shah Alam<br>Daerah Petaling<br>Selangor.  | 2.98   | 02-07-2009  |
| <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>  |   |  |  |   |
| 87  | No. 2, Jalan Midah 2<br>Taman Midah Cheras<br>Cheras, 56000 Kuala Lumpur.<br>Tel : 03-9133 5100 Faks : 03-9132 3641   | TESCO Extra Cheras<br>Lot PT 4476<br>Mukim Kuala Lumpur<br>Daerah Kuala Lumpur<br>Wilayah Persekutuan.   | 2.98   | 02-07-2009  |
| <b>Tesco Stores (Malaysia) Sdn. Bhd.</b>  |   |  |  |   |
| 88  | Tesco Extra Seremban<br>Kawasan Perindustrian Oakland<br>70300 Seremban 2, Negeri Sembilan.<br>Tel : 06-762 3227 Faks : 06-762 3241   | TESCO Extra Seremban<br>Lot PT 452<br>Pekan Bukit Kepayan<br>Daerah Seremban<br>Negeri Sembilan.   | 2.13   | 02-07-2009  |
| <b>MRCB Selborn Corporation Sdn. Bhd.</b> |   |  |  |   |
| 89  | MRCB Central Properties Sdn. Bhd.<br>Level 22, 1 Sentral, Jalan Travers, Kuala Lumpur Sentral<br>P.O.Box 12640, 50470 Kuala Lumpur.<br>Tel : 03-2786 8080 Faks : 03-2780 7787 | Plaza Alam Sentral<br>Lot 58, Seksyen 14<br>Mukim Bandar Shah Alam<br>Daerah Petaling, Selangor.   | 11.00  | 08-07-2009  |
| <b>Malaysia Airports Sdn. Bhd.</b>        |   |  |  |   |
| 90  | Lapangan Terbang Antarabangsa Langkawi<br>07100 Padang Mat Sirat<br>Langkawi, Kedah.<br>Tel : 04-955 1311 / 955 1312 Faks : 04-955 1314                                       | Lapangan Terbang Antarabangsa<br>Langkawi<br>TK1 Mukim Bohor & TK2 Mukim<br>Padang Mat Sirat<br>& TK3, TK4 Mukim Kedawang<br>Daerah Langkawi, Kedah. | 2.29   | 17-07-2009  |
| <b>Amtrustee Berhad</b>                   |   |  |  |   |
| 91  | PT 487, Mahkota Parade<br>Jalan Banda Hilir, Kg. Banda Hilir<br>75000 Melaka.<br>Tel : 06-282 6151 Faks : 06-282 7305   | Mahkota Parade<br>Lot PT 487<br>Mukim Melaka Tengah<br>Daerah Melaka<br>Melaka.  | 10.80  | 17-07-2009  |
| <b>Malaysia Airports Sdn. Bhd.</b>        |   |  |  |   |
| 92  | Lapangan Terbang Sultan Ahmad Shah<br>25150 Kuantan, Pahang.<br>Tel : 09-531 2150 / 531 2123 Faks : 09-538 4017   | Lapangan Terbang Sultan Ahmad<br>Shah<br>Lot PT 86418, Mukim Kuala Kuantan<br>Daerah Kuantan, Pahang.  | 0.33   | 17-07-2009  |

| No.   | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply   | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|---|--|---|---|--|
| <b>Malaysia Airports Sdn. Bhd.</b>                        |  |   |   |  |
| 93  | Lapangan Terbang Antarabangsa Pulau Pinang<br>11900 Bayan Lepas<br>Pulau Pinang.<br>Tel : 04-643 4411 Faks : 04-643 5399                                   | Lapangan Terbang Antarabangsa Pulau Pinang<br>Lot 7565 dan PT 230, 231, 232, 228, 229, 3096,<br>1610, TK1 dan TK2, Mukim 12<br>Daerah Barat Daya<br>Pulau Pinang. | 4.00  | 17-07-2009   |
| <b>Abi Construction Sdn. Bhd.</b>                         |  |   |   |  |
| 94  | No. 332A, Lorong Serawak<br>Melawati Urban 1, Pusat Bandar Melawati<br>53100 Kuala Lumpur.<br>Tel : 03-4147 3733 Faks : 03-4147 4733                       | Plaza Paya Bunga<br>Lot PT 3073K<br>Bandar Kuala Terengganu<br>Daerah Kuala Terengganu<br>Terengganu.   | 3.83  | 31-07-2009   |
| <b>Pembinaan Titis Jaya Sdn. Bhd.</b>                     |  |   |   |  |
| 95  | TJ Mart, Lot 5035, Batu 17 1/2<br>Jalan Air-Hitam, Saleng, 81400 Senai, Johor.<br>Tel : 07-598 4323 Faks : 07-598 5323                                     | T.J. Mart, Lot 5035<br>Mukim Kulai<br>Daerah Kulaijaya<br>Johor.  | 0.55  | 11-09-2009   |
| <b>Mydin Mohamed Holdings Bhd.</b>                        |  |   |   |  |
| 96  | Mydin Melaka Hypermarket<br>Lot 15060, 15061, 15062, Mukim Bukit Katil<br>Melaka Tengah, 75450 Ayer Keroh, Melaka.<br>Tel : 06-231 3007 Faks : 06-231 3070 | MYDIN Wholesale Hypermarket<br>MITC Melaka<br>Lot 15060, 15061 & 15062<br>Mukim Bukit Katil<br>Daerah Melaka Tengah<br>Melaka.                                    | 4.30  | 14-09-2009   |
| <b>Kuantan Port Consortium Sdn. Bhd.</b>                  |  |   |   |  |
| 97  | Wisma KPC, Km. 25, Tanjung Gelang, P.O.Box 199<br>25720 Kuantan, Pahang.<br>Tel : 09-586 3888 Faks : 09-586 3777   | Kuantan Port<br>Lot 1863, Mukim Sungai Karang<br>Daerah Kuantan<br>Pahang.  | 3.49  | 05-10-2009   |
| <b>AEON Co. (M) Bhd.</b>                                  |  |   |   |  |
| 98  | AEON Bandaraya Melaka Shopping Centre<br>No. 2, Jalan Lagenda<br>Taman 1 - Lagenda, 75400 Melaka.<br>Tel : 06-282 9389 Faks : 06-281 6398                  | Jusco Shopping Mall<br>Lot PT 1 Kawasan Bandar 32 dan PT<br>69 Kawasan Bandar 33<br>Daerah Melaka Tengah<br>Melaka  | 22.50                                       | 05-10-2009   |
| <b>Shell Refining Company (Federation Of Malaya) Bhd.</b> |  |   |   |  |
| 99  | Batu 1, Jalan Pantai<br>71000 Port Dickson, Negeri Sembilan.<br>Tel : 06-647 1311 Faks : 06-647 4622   | 71000 Port Dickson<br>Negeri Sembilan.  | 35.00                                       | 05-10-2009   |
| <b>Couture Homes Sdn. Bhd.</b>                            |  |   |   |  |
| 100   | A-12-02, Empire Office, Empire Subang, Jalan SS 16/1<br>47500 Subang Jaya, Selangor.<br>Tel : 03-5638 9888 Faks : 03-5631 9888                             | Lot 6 dan PT 20912<br>Mukim Bandar Subang Jaya<br>Daerah Petaling<br>Selangor   | 8.67  | 22-12-2009   |
| <b>Kumpulan Wang Simpanan Pekerja</b>                     |  |   |   |  |
| 101   | Jabatan Pengurusan Harta<br>Tingkat 14, Bangunan KWSP, Jalan Raja Laut<br>50350 Kuala Lumpur.<br>Tel : 03-2616 2269 Faks : 03-2693 8704                    | Lot 842, Seksyen 14<br>Mukim Bandar Georgetown<br>Daerah Timur Laut<br>Pulau Pinang   | 3.40  | 25-01-2010   |



| No.                                      | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|--|---|---|--|---|
| <b>Ipoh Tower Sdn. Bhd.</b>              |   |   |  |   |
| 102                                      | Unit No. 2FO-1, Ipoh Tower<br>Jalan Dato' Seri Ahmah Said<br>Greentown, 30450 Ipoh, Perak.<br>Tel : 05-241 4662 Faks : 05-242 4563  | Complex Ipoh Tower Sdn. Bhd.<br>Lot 23628 Mukim Bandar Ipoh (S) &<br>23629, 8701U, 9570U<br>Mukim Bandar Ipoh (U)<br>Daerah Kinta, Perak. | 4.25   | 03-05-2010  |
| <b>Jasa Imani Sdn. Bhd.</b>              |   |   |  |   |
| 103                                      | B-44, Tingkat Bawah dan Atas<br>Pusat Komersial Semambu, Jalan Semambu<br>25300 Kuantan, Pahang.<br>Tel : 09-566 9024 Faks : 09-568 4770  | Menara Pejabat Putra Square<br>Lot 423, Seksyen 20(PN5596)<br>Jalan Bukit Sekilau<br>Bandar Kuantan<br>Pahang.                            | 4.25   | 27-09-2010  |
| <b>Sepang Goldcoast Sdn. Bhd.</b>        |   |   |  |   |
| 104                                      | No. 30B 1st & 2nd Floor, Jalan Pekedai U1/36<br>Section U1<br>Hicom Glenmarie Industrial Park<br>40150 Shah Alam, Selangor.<br>Tel : 03-5569 0800 Faks : 03-5569 0900 / 5569 2488 | Lot PT 5247 (PKT 67)<br>Pantai Bagan Lalang, Mukim<br>Sepang<br>Daerah Sepang<br>Selangor.  | 9.50   | 13-12-2010  |
| <b>Setia Haruman Sdn. Bhd.</b>           |   |   |  |   |
| 105                                      | (Property Management Department)<br>The Lodge, Persiaran Multimedia, Cyber 7<br>63000 Cyberjaya, Selangor.<br>Tel : 03-8312 8000 Faks : 03-8312 8077                              | The Lodge<br>Persiaran Multimedia, Cyber 7<br>63000 Cyberjaya, Selangor.  | 15.50  | 22-12-2010  |
| <b>Gch Retail (Malaysia) Sdn. Bhd.</b>   |   |   |  |   |
| 106                                      | Giant Superstore Lukut<br>Lot 12532, Jalan Dataran Segar<br>Batu 3, Jalan Seremban<br>71010 Port Dickson, Negeri Sembilan.  | Giant Superstore Lukut Complex<br>Lot No. 12532 (Old Lot 1058)<br>Mukim Port Dickson<br>Daerah Port Dickson<br>Negeri Sembilan.           | 2.55   | 22-12-2010  |
| <b>Petronas Chemicals Mtbe Sdn. Bhd.</b> |   |   |  |   |
| 107                                      | Lot 111/112, Kawasan Perindustri Gebeng<br>Peti Surat 1/2<br>26080 Balok, Kuantan, Pahang.<br>Tel : 09-585 6778 / 585 6700<br>Faks : 09-585 6751 / 585 4090                       | Polypropylene Malaysia Sdn. Bhd.<br>(PMSB)<br>No. Lot 111 dan 112<br>Mukim Gebeng, Daerah Kuantan<br>26080 Kuantan<br>Pahang.             | 40.00  | 24-12-2010  |
| <b>Sun Victory Sdn. Bhd.</b>             |   |   |  |   |
| 108                                      | Unit A5-UG1-01, Block A5, Solaris Dutamas<br>No. 1, Jalan Dutamas 1, 50480 Kuala Lumpur.<br>Tel : 03-6207 9426 Faks : 03-6207 9427  | No. 1, Jalan Dutamas 1<br>50480 Kuala Lumpur.   | 5.08   | 18-01-2011  |
| <b>Aston Villa Sdn. Bhd.</b>             |   |   |  |   |
| 109                                      | 33-1-1 Villa Scott, Jalan Scott, Brickfields<br>50470 Kuala Lumpur.<br>Tel : 03-2381 7777 Faks : 03-2381 8010   | Lot 1810 (P.T. 3717 & P.T. 3718)<br>Jalan Kelang Lama<br>58200 Kuala Lumpur.  | 5.41   | 29-04-2011  |
| <b>Amtrustee Berhad</b>                  |   |   |  |   |
| 110                                      | Capitamalls Malaysia Trust, 170-06-01, Plaza Gurney<br>Persiaran Gurney, 10250 Penang.<br>Tel : 03-2279 9863 Faks : 03-2279 9889  | No. Lot 2903, Mukim Seksyen 1<br>Daerah Timur Laut<br>10250 Pulau Pinang.   | 22.50  | 29-04-2011  |
| <b>Festival City Sdn. Bhd.</b>           |   |   |  |   |
| 111                                      | Level 5, Klang Parade, No. 2112, Jalan Meru<br>41050 Klang, Selangor.<br>Tel : 03-3344 2882 / 3344 9889 Faks : 03-3344 2889   | No. Lot 26220<br>Mukim Setapak<br>53300 Kuala Lumpur.   | 7.86   | 29-04-2011  |

| No.  | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address   | Kawasan Bekalan<br>Area of Supply  | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|--|---|--|---|--|
| <b>Viva Mall Sdn. Bhd.</b>                         |   |  |   |  |
| 112  | Penthouse Corporate Suites, D-11-1 & @ Level 13, Block D<br>Menara Uncang Emas (Ue3), No. 85, Jalan Loke Yew<br>55200 Kuala Lumpur.<br>Tel : 03-9281 3888 Faks : 03-9281 8993   | Lot P.T. 4<br>Section 91A<br>Jalan Loke Yew<br>55200 Kuala Lumpur.   | 14.02                                       | 29-04-2011   |
| <b>AEON Co. (M) Bhd.</b>                           |   |  |   |  |
| 113  | AEON Mahkota Cheras Shopping Centre Management Office, 1 <sup>st</sup> Floor, Jalan Temenggung 21/9<br>Persiaran Mahkota Cheras 1, Bandar Mahkota Cheras<br>43200 Cheras, Selangor.<br>Tel : 03-9080 3579 Faks : 03-9080 3580 | Lot PT 47250<br>Mukim Cheras<br>Daerah Hulu Langat<br>43200 Selangor.  | 3.50  | 29-04-2011   |
| <b>AEON Co. (M) Bhd.</b>                           |   |  |   |  |
| 114  | AEON Taman Equine Shopping Centre<br>No. 2, Jalan Equine Taman Equine, Bandar Putra Permai<br>43300 Seri Kembangan, Selangor.<br>Tel : 03-8945 2700 Faks: 03-8945 3700  | AEON Taman Equine Shopping Mall<br>No. Lot 53391 (PT 27427)<br>Mukim Petaling<br>Daerah Petaling<br>Selangor.                              | 5.44  | 11-05-2011   |
| <b>Jastamax Sdn. Bhd.</b>                          |   |  |   |  |
| 115  | Wisma Mah Sing, Penthouse Suite 2<br>No. 163, Jalan Sungai Besi, 57100 Kuala Lumpur.<br>Tel : 03-9221 6888 Faks : 03-9222 8380  | Lot PT 657<br>Seksyen 92<br>Sungai Besi<br>57100 Kuala Lumpur.   | 2.72  | 26-05-2011   |
| <b>Upwell Shopping Complex (Segamat) Sdn. Bhd.</b> |   |  |   |  |
| 116  | No. 25 - 39, Jalan Syed Abdul Kadir<br>85000 Segamat, Johor.<br>Tel : 07-932 8888 Faks: 07-932 4732   | Lot PTD 6880 – 6894<br>Jalan Syed Abdul Kadir<br>85000 Segamat<br>Johor.   | 0.75  | 26-05-2011   |
| <b>Greenhill Resources Sdn. Bhd.</b>               |   |  |   |  |
| 117  | Setia Alam Welcome Centre, No. 2, Jalan Setia Indah AD/U13 1 AD<br>Setia Alam, Seksyen U13, 40170 Shah Alam, Selangor.<br>Tel : 03-3344 9949 Faks : 03-3344 3546  | No. PT 26535, Mukim Bukit Raja<br>Daerah Petaling<br>Selangor.   | 17.00                                       | 24-06-2011   |
| <b>Malaysia Airports Sdn. Bhd.</b>                 |   |  |   |  |
| 118  | Lapangan Terbang Sultan Abdul Aziz Shah<br>47200 Subang<br>Selangor.<br>Tel : 03-7846 7777 Faks: 03-7846 3300   | Lapangan Terbang Sultan Abdul Aziz Shah Complex<br>Lot 1210 dan PT 46225<br>Mukim Sungai Buloh dan Damansara, Daerah Petaling<br>Selangor. | 14.00                                       | 29-06-2011   |
| <b>Malaysia Airports Sdn. Bhd.</b>                 |   |  |   |  |
| 119  | Lapangan Terbang Sultan Mahmud<br>21300 Kuala Terengganu, Terengganu.<br>Tel : 09-667 3666 / 662 4084 Faks : 09-662 6670  | Lot 11467, PT12716K, PT12717K,<br>PT12718<br>Lapangan Terbang Sultan Mahmud<br>Terengganu.   | 1.60  | 29-06-2011   |
| <b>Malaysia Airports Sdn. Bhd.</b>                 |   |  |   |  |
| 120  | Lapangan Terbang Sultan Abdul Halim<br>06550 Alor Setar, Kedah.<br>Tel : 04-714 2994 Faks : 04-714 5345   | Lot TK1, TK2, TK3, PT230, 945, 824,<br>831, 828, 001061<br>Lapangan Terbang Sultan Abdul Halim, Kedah.                                     | 1.31  | 29-06-2011   |

| No.   | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|---|---|---|--|---|
| <b>Badan Pengurusan Bersama Riviera Bay Condominium</b>                 |   |   |  |   |
| 121   | b/p Badan Pengurusan Bersama Kondominium Riviera Bay<br>P.O. Box 112, 75720 Melaka.<br>Tel : 06-292 6700 Faks : 06-292 6700   | Lot 134, 135, 136, 137, 292 dan Sebahagian Lot 281 dan 133, Tanjung Keling, Melaka Tengah Melaka.                                 | 3.00   | 25-07-2011  |
| <b>GSL Development Sdn. Bhd.<br/>(Bellworth Developments Sdn. Bhd.)</b> |   |   |  |   |
| 122   | No. 16, Jalan Wan Kadir<br>Taman Tun Dr. Ismail, 60000 Kuala Lumpur.<br>Tel : 03-7726 6688 Faks: 03-7725 8285   | No. Lot 51888<br>Mukim Kuala Lumpur<br>60000 Wilayah Persekutuan Kuala Lumpur.  | 6.42   | 27-07-2011  |
| <b>Perstima Utility Sdn. Bhd.</b>                                       |   |   |  |   |
| 123   | PLO 255 Jalan Timah 3<br>Kawasan Perindustrian Pasir Gudang<br>81700 Pasir Gudang, Johor.<br>Tel : 07-254 1200 Faks : 07-251 4618   | Perstima Berhad, No. Lot 00051694<br>Mukim Plentong<br>Daerah Johor Bahru<br>Johor.   | 5.67   | 27-07-2011  |
| <b>Kenanga Wholesale City Sdn. Bhd.</b>                                 |   |   |  |   |
| 124   | 8-01, Kompleks Kenanga Wholesale City<br>No. 2, Jalan Gelugor, Off Jalan Kenanga<br>55200 Kuala Lumpur.<br>Tel : 03-9222 2082 Faks : 03-9221 8082   | Lot 477, Jalan Merlimau<br>Seksyen 69<br>55200 Kuala Lumpur.  | 14.45  | 04-08-2011  |
| <b>Plus Expressways</b>   |   |   |  |   |
| 125   | Menara Korporat, Persada PLUS<br>Persimpangan Bertingkat Subang<br>KM 15, Lebuhraya Baru Lembah Klang<br>47301 Petaling Jaya, Selangor.<br>Tel : 03-7801 6666 / 7666 4666 Faks : 03-7801 6600 | 35 Locations under PLUS<br>Expressways  | 6.99   | 26-08-2011  |
| <b>AEON Co. (M) Bhd.</b>  |   |   |  |   |
| 126   | JUSCO Melaka Shopping Centre<br>Leboh Ayer Keroh, 75450 Melaka.<br>Tel : 06-7232 4899 / 231 4929 Faks: 06-233 2988  | Lot 4991 (P.T. 7041)<br>Mukim Bukit Baru<br>Daerah Melaka Tengah<br>75450 Melaka.   | 5.60   | 21-09-2011  |
| <b>AEON Co. (M) Bhd.</b>  |   |   |  |   |
| 127   | JUSCO Permas Jaya Shopping Centre<br>No. 1, Jalan Permas Jaya Utara<br>Bandar Baru Permas Jaya, 81750 Johor Bahru, Johor.<br>Tel : 07-388 0600 Faks: 07-386 1600                              | AEON Bandar Baru Permas Jaya<br>Lot 147003, Zone 3-1<br>Mukim Permas Jaya<br>81750 Johor Bahru<br>Johor.                          | 4.05   | 21-09-2011  |
| <b>AEON Co. (M) Bhd.</b>  |   |   |  |   |
| 128   | Jusco Taman Maluri Shopping Centre, 1st. Floor<br>Jalan Jejaka, Taman Maluri<br>Cheras, 55100 Kuala Lumpur.<br>Tel : 03-9285 5222 Faks : 03-9285 9999   | Lot 33, 2386, 2595, 2596 dan 2388<br>Taman Maluri<br>Jalan Jejaka, Seksyen 90A, Cheras<br>55100 Wilayah Persekutuan Kuala Lumpur. | 4.80   | 21-09-2011  |
| <b>CSF Advisers Sdn. Bhd.</b>   |   |   |  |   |
| 129   | 3552 Jalan Teknokrat 6<br>63000 Cyberjaya, Selangor.<br>Tel : 03-8318 1313 Faks: 03-8318 0303   | Lot PT 12125<br>Mukim Dengkil<br>Daerah Sepang<br>63000 Selangor.   | 6.80   | 18-10-2011  |
| <b>CSF CX Sdn. Bhd.</b>   |   |   |  |   |
| 130   | 7118 Jalan Impact<br>63000 Cyberjaya, Selangor.<br>Tel : 03-8318 1313 Faks: 03-8318 0303  | Lot PT 12144 dan Lot 12145<br>Mukim Dengkil<br>Daerah Sepang<br>63000 Selangor.   | 20.40  | 18-10-2011  |

| No.   | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply   | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|---|--|---|---|--|
| <b>Optimistic Organic Sdn. Bhd.</b>             |  |   |   |  |
| 131   | Lot 3351, Teluk Kalong Industrial Estate<br>24007 Kemaman, Terengganu<br>Tel : 09-863 3029 / 863 3031 Faks : 09-863 3085   | Plot No. 4248<br>Telok Kalong Industries Estate<br>24007 Kemaman<br>Terengganu.   | 7.00  | 20-10-2011   |
| <b>Hunza Properties (Penang) Sdn. Bhd.</b>      |  |   |   |  |
| 132   | 5-4-8/11, Hunza Complex<br>Jalan Gangsa, Island Park, 11600 Penang.<br>Tel : 04-659 6210 Faks: 04-657 2831   | No. Lot 2960 (Plot A) dan 2961 (Plot B)<br>Mukim Seksyen 1<br>Daerah Timur Laut<br>Pulau Pinang.  | 16.00                                       | 03-11-2011   |
| <b>AEON Co. (M) Bhd.</b>                        |  |   |   |  |
| 133   | AEON Ipoh Station 18 Shopping Centre<br>No. 2, Susuran Stesen 18, Station 18<br>31650 Ipoh, Perak.   | AEON Station 18<br>Nol Lot 305553, 305554 & 305555 (PT 239099)<br>Mukim Hulu Kinta, Daerah Kinta<br>31650 Perak.                                | 16.00                                       | 03-11-2011   |
| <b>Amtrustee Berhad</b>                         |  |   |   |  |
| 134   | CapitaMalls Malaysia Trust, Box No. 228, Level 4<br>Centre Management Office, The Mines, Jalan Dulang<br>MINES Resort City, Seri Kembangan, 43300 Selangor.<br>Tel : 03-8949 6288 Faks: 03-8949 6388 | The Mines<br>No. Lot PT 16722<br>Mukim Petaling<br>Daerah Petaling<br>43300 Selangor.   | 10.00                                       | 22-11-2011   |
| <b>OSK TRUSTEE BERHAD</b>                       |  |   |   |  |
| 135   | 6 <sup>th</sup> Floor, Plaza OSK<br>Jalan Ampang<br>50450 Kuala Lumpur.<br>Tel : 03-7494 3000 Faks: 03-7492 6333   | Sunway Pyramid Shopping Centre<br>PT 161, Lot 32 dan Lot 51175<br>Bandar Sunway<br>Petaling Jaya<br>Selangor.                                   | 22.00                                       | 28-11-2011   |
| <b>Jelas Puri Sdn. Bhd.</b>                     |  |   |   |  |
| 136   | No. 63, Lorong Batu Nilam 1A<br>Bandar Bukit Tinggi, 41200 Klang<br>Selangor.<br>Tel : 03-3324 3255 Faks : 03-3323 3257  | Paradigm Shopping Complex @<br>Kelana Jaya<br>Lot PT11, PT12, PT13 dan PT15<br>Bandar Petaling Jaya Tambahan II<br>Daerah Petaling<br>Selangor. | 6.50  | 03-02-2012   |
| <b>AEON Co. (M) Bhd.</b>                        |  |   |   |  |
| 137   | AEON Rawang Anggun Shopping Centre<br>No. 1, Kompleks Beli-belah AEON Rawang Anggun<br>Persiaran Anggun, Taman Anggun, 48000 Rawang<br>Selangor.   | AEON Rawang Shopping Complex<br>No. Lot 1851 & 1246<br>Mukim Rawang<br>Daerah Gombak<br>Selangor.   | 8.50  | 14-02-2012   |
| <b>Wisma Mirama Sdn. Bhd.</b>                   |  |   |   |  |
| 138   | 6 <sup>th</sup> Floor, Wisma Mirama<br>Jalan Wisma Putra, 50460 Kuala Lumpur.<br>Tel : 03-2142 1666 Faks : 03-2148 1229  | Wisma Mirama Complex<br>Lot 888, Seksyen 69<br>Daerah Kuala Lumpur<br>50460 Wilayah Persekutuan<br>Kuala Lumpur.                                | 1.44  | 14-02-2012   |
| <b>Sungei Wang Plaza Management Corporation</b> |  |   |   |  |
| 139   | Lower Basement 1, Sungei Wang Plaza<br>SWP Box No.:009, Jalan Bukit Bintang,<br>55100 Kuala Lumpur.<br>Tel : 03-2142 6636 / 2144 9988 Faks : 03-2144 5269  | Kompleks Beli-Belah Sungei Wang<br>No. Lot 1197<br>Daerah Bukit Bintang<br>Wilayah Persekutuan Kuala Lumpur.                                    | 20.00                                       | 21-02-2012   |

| No.   | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>  | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|---|---|---|--|---|
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>      |   |   |  |   |
| 140   | Mezzanine Floor,<br>Giant Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan, Seksyen 13<br>40100 Shah Alam, Selangor.<br>Tel : 03-5544 8888 Faks : 03-5511 9692 | Giant Hypermarket<br>No. Lot PT 128899,<br>Jalan Kebun (KS7)<br>Mukim Klang<br>Daerah Klang<br>Selangor   | 1.53   | 23-02-2012  |
| <b>Universiti Tenaga Nasional Sdn. Bhd.</b> |   |   |  |   |
| 141   | UNITEN, Kampus Putrajaya, Jalan IKRAM-UNITEN<br>43000 Kajang, Selangor.<br>Tel : 03-8921 2020 Faks : 03-8928 7166   | Kampus UNITEN Putrajaya<br>Jalan IKRAM-UNITEN<br>43000 Kajang<br>Selangor.  | 3.83   | 22-03-2012  |
| <b>Universiti Tenaga Nasional Sdn. Bhd.</b> |   |   |  |   |
| 142   | UNITEN, Kampus Putrajaya, Jalan IKRAM-UNITEN<br>43000 Kajang, Selangor.<br>Tel : 03-8921 2020 Faks : 03-8928 7166   | Kampus UNITEN Sultan Haji Ahmad Shah<br>26700 Bandar Muadzam Shah<br>Pahang.  | 2.98   | 22-03-2012  |
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>      |   |   |  |   |
| 143   | Mezzanine Floor,<br>Giant Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan, Seksyen 13<br>40100 Shah Alam, Selangor.<br>Tel : 03-5544 8888 Faks : 03-5511 9692 | Giant Hypermarket Banting<br>Sebahagian Lot 555 seluas 8.15 ekar<br>Mukim Tanjung Dua Belas<br>Daerah Kuala Langat<br>Selangor.   | 3.40   | 22-03-2012  |
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>      |   |   |  |   |
| 144   | Mezzanine Floor,<br>Giant Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan, Seksyen 13<br>40100 Shah Alam, Selangor.<br>Tel : 03-5544 8888 Faks : 03-5511 9692 | Kompleks Beli-belah Giant Cheras<br>Hypermarket<br>No. Lot 33924<br>Mukim Pekan Cheras<br>Daerah Hulu Langat<br>43200 Selangor.   | 3.40   | 23-03-2012  |
| <b>Amtrustee Berhad</b>                     |   |   |  |   |
| 145   | Lot 10.00.00 Level 10, Pavilion Kuala Lumpur<br>168 Jalan Bukit Bintang<br>55100 Kuala Lumpur.<br>Tel : 03-2118 8888 Faks : 03-2118 8911                              | Pavillion Kuala Lumpur Complex<br>Lot 174, 185, 187, 188, 281 (New<br>Lot : Lot 332) dan 260<br>Jalan Bukit Bintang/<br>Jalan Raja Chulan<br>Seksyen 67, Kuala Lumpur<br>Wilayah Persekutuan. | 22.10  | 17-04-2012  |
| <b>EC Alamjaya Sdn. Bhd.</b>                |   |   |  |   |
| 146   | No. 2, Jalan 1/128<br>Taman Gembira, Jalan Klang Lama<br>58200 Kuala Lumpur.<br>Tel : 03-7983 7399 Faks: 03-7981 8813   | Kota Bharu Trade Centre (KBTC)<br>No. Lot PT 255<br>Seksyen 7, Jajahan Kota Bharu<br>15000 Bandar Kota Bharu<br>Kelantan.   | 5.84   | 20-04-2012  |
| <b>Universiti Telekom Sdn. Bhd.</b>         |   |   |  |   |
| 147   | Universiti Multimedia<br>Persiaran Multimedia<br>63100 Cyberjaya, Selangor.<br>Tel : 03-8312 5000 Faks : 03-8312 5022   | Kawasan Universiti Multimedia<br>Cyberjaya<br>Lot PT 12197<br>Mukim Dengkil<br>Daerah Sepang<br>63100 Selangor.   | 5.10   | 26-04-2012  |

| No. | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address   | Kawasan Bekalan<br>Area of Supply   | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|-----|---|---|---|--|
| 148 | <b>Universiti Telekom Sdn. Bhd.</b>   |   |   |  |
|     | Universiti Multimedia<br>Jalan Ayer Keroh Lama<br>75450 Melaka.<br>Tel : 06-252 3500 Faks : 06-231 7989   | Kawasan Universiti Multimedia<br>Melaka<br>Lot PT452, PT453, Lot 56, 57, 58<br>dan 60<br>Bukit Beruang<br>Melaka Tengah<br>75450 Melaka.  | 8.00  | 26-04-2012   |
| 149 | <b>Malaysian Landed Property Sdn. Bhd.</b>  |   |   |  |
|     | Jones Lang Wootton, Lower Ground, Menara Perak<br>No. 24, Jalan Perak, 50450 Kuala Lumpur.<br>Tel : 03-2380 5032 Faks : 03-2380 5029  | Lot 1370, Jalan Perak<br>Seksyen 57<br>Kuala Lumpur.  | 3.00  | 10-05-2012   |
| 150 | <b>Era Baru Sdn. Bhd.</b>   |   |   |  |
|     | Property Management Division, Terminal 2,<br>Level 4 Lot 7968-C<br>Jalan Era Square 4, Era Square, 70200 Seremban.<br>Tel : 06-768 7680 Faks: 06-768 7686                         | Lot 734<br>Bandar Seremban<br>70200 Negeri Sembilan.  | 5.95  | 22-05-2012   |
| 151 | <b>Mammoth Empire Estate Sdn. Bhd.</b>  |   |   |  |
|     | A-12-02, Empire Office<br>Empire Subang, Jalan SS16/1<br>47500 Selangor.<br>Tel : 03-5638 9888 Faks : 03-5631 9888  | Lot PT47371<br>Mukim Sungai Buloh<br>Daerah Petaling<br>Selangor.   | 8.48  | 25-06-2012   |
| 152 | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |   |  |
|     | Mezzanine Floor,<br>Giant Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan<br>Seksyen 13<br>40100 Shah Alam<br>Selangor.<br>Tel : 03-5544 8888 Faks : 03-5511 9692         | Giant Subang Jaya Hypermarket<br>No. Lot 672 dan 673<br>Persiaran Subang Permai<br>Taman Industri Subang<br>Ulu Subang Jaya 1<br>47300 Mukim Damansara<br>Daerah Petaling, Selangor.                  | 4.25  | 02-07-2012   |
| 153 | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |   |  |
|     | Mezzanine Floor,<br>Giant Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan, Seksyen 13<br>40100 Shah Alam, Selangor.<br>Tel : 03-5544 8888 Faks : 03-5511 9692             | Mezzanine Floor, Giant<br>Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan, Seksyen 13<br>40100 Shah Alam, Selangor.<br>Tel : 03-5544 8888<br>Faks : 03-5511 9692                              | 2.04  | 02-07-2012   |
| 154 | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |   |  |
|     | Mezzanine Floor,<br>Giant Hypermarket Shah Alam Stadium<br>Lot 2, Persiaran Sukan<br>Seksyen 13<br>40100 Shah Alam<br>Selangor.<br>Tel : 03-5544 8888 Faks : 03-5511 9692         | Giant Setapak Hypermarket<br>No. Lot 23341, 23344 (PT8750) dan<br>Sebahagian Lot 23343<br>Off jalan Genting Kelang<br>Taman Danau Kota<br>Mukim Setapak<br>53000 Wilayah Persekutuan<br>Kuala Lumpur. | 2.72  | 02-07-2012   |
| 155 | <b>Must Ehsan Development Sdn. Bhd.</b>   |   |   |  |
|     | No. 46G, Jalan PJU 5/22, The Strand Encorp<br>Pusat Perdagangan Kota Damansara<br>Kota Damansara PJU 5<br>47810 Petaling Jaya, Selangor.<br>Tel : 03-6286 7777 Faks: 03-6286 7615 | No. Lot PT 10562<br>Pusat Bandar 1<br>Kota Damansara<br>Mukim Sungai Buloh<br>Daerah Petaling<br>Selangor.  | 8.55  | 02-07-2012   |

| No. | Pemegang Lesen & Alamat Perhubungan<br><i>Licensee &amp; Contact Address</i>   | Kawasan Bekalan<br><i>Area of Supply</i>  | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Tarikh Lesen Dikeluarkan<br><i>Date of Licence Issued</i> |
|-----|--|---|--|---|
| 156 | <b>Esquire Collection Sdn. Bhd.</b>  |   |  |   |
|     | Suite 6.04, Penthouse<br>Wisma Academy, 4A Jalan 19/1<br>46300 Petaling Jaya, Selangor.<br>Tel : 03-7958 5928 Faks : 03-7954 2098                              | Bangunan PanGlobal<br>No. Lot 53, Seksyen 20<br>Mukim Bandar Petaling Jaya<br>Daerah Petaling<br>Selangor.  | 1.00   | 05-07-2012  |
| 157 | <b>Prestige Scale Sdn. Bhd.</b>  |   |  |   |
|     | Unit 9-3, Level 9, Wisma UOA Damansara II<br>No. 6, Changkat Semantan<br>Damansara Heights, 50490 Kuala Lumpur.<br>Tel : 03-2094 8778 Faks : 03-2094 8779      | Menara Prestige<br>Lot 844 dan PT 845<br>Seksyen 57<br>Jalan P. Ramlee/Jalan Pinang<br>50450 Kuala Lumpur.  | 8.50   | 05-07-2012  |
| 158 | <b>Badan Pengurusan Bersama Queensbay Mall</b>   |   |  |   |
|     | 1F-78, Queensbay Mall<br>100, Persiaran Bayan Indah<br>11900 Bayan Lepas<br>Pulau Pinang.<br>Tel : 04-646 8888 Faks : 04-646 4848                              | Lot 11736 & Lot 11737 (PT. 5494)<br>Tanah Tebusguna<br>Kawasan Persisiran Pantai Sungai<br>Nibong, Mukim 12<br>Daerah Barat Daya<br>11900 Pulau Pinang. | 20.00  | 05-07-2012  |
| 159 | <b>MCT Green Technologies Sdn. Bhd.</b>  |   |  |   |
|     | No. 25, Jalan USJ 21/10<br>47630 UEP Subang Jaya<br>Selangor.<br>Tel : 03-8023 9988 Faks : 03-8024 9185  | One City Skypark<br>No. Lot 54445 & 77027<br>Mukim Damansara<br>Daerah Petaling Jaya,<br>Selangor.  | 10.16  | 16-07-2012  |
| 160 | <b>Pasti Anggun Sdn. Bhd.</b>  |   |  |   |
|     | 6 <sup>th</sup> Floor, Asmah Tower<br>Jalan Cerdas, Taman Connaught<br>56100 Kuala Lumpur.<br>Tel : 03-9100 2882 Faks : 03-9100 1881                           | Ikon Mall<br>No. Lot 39891<br>Mukim Petaling<br>Daerah Kuala Lumpur<br>Wilayah Persekutuan Kuala Lumpur.  | 3.44   | 16-07-2012  |
| 161 | <b>Wize Platinum Sdn. Bhd.</b>   |   |  |   |
|     | 2A-2, Jalan Puteri 1/4<br>Bandar Puteri<br>47100 Puchong<br>Selangor.<br>Tel : 03-8061 3380 Faks : 03-8061 3315  | South City Plaza<br>Lot PT 520<br>Serdang Perdana<br>Seri Kembangan, Mukim Petaling<br>Daerah Petaling, Selangor.                                       | 3.00   | 27-07-2012  |
| 162 | <b>Genting Simon Sdn. Bhd.</b>   |   |  |   |
|     | Johor Premium Outlets<br>Jalan Premium Outlets, Indahpura<br>81000 Kulajjaya, Johor.<br>Tel : 07-661 8888 Faks : 07-661 8810                                   | Lot PTD 104549<br>Zone 23, Jalan Premium Outlets<br>Indahpura<br>Kulajjaya<br>81000 Johor.  | 4.08   | 13-08-2012  |
| 163 | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>   |   |  |   |
|     | Complex Management, Giant Hypermarket Rawang<br>No. 1, Jalan Bintang, Pusat Bandar Rawang<br>48000 Rawang, Selangor.<br>Tel : 03-6092 0161 Faks : 03-6092 0161 | Giant Hypermarket Rawang<br>Lot PT 65 & PT 66<br>Mukim Rawang<br>Daerah Gombak<br>48000 Selangor.   | 1.28   | 05-9-2012   |
| 164 | <b>Atria Damansara Sdn. Bhd.</b>   |   |  |   |
|     | 9 <sup>th</sup> Floor, Plaza OSK<br>Jalan Ampang, 50450 Kuala Lumpur.<br>Tel : 03-2161 3322 Faks : 03-2175 3216  | No. Lot PT 9089, PT 9090, PT<br>10168, PT10197, PT 10198<br>Mukim Sungai Buloh<br>Daerah Petaling<br>47400 Selangor.                                    | 11.50  | 27-09-2012  |



| No.   | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address   | Kawasan Bekalan<br>Area of Supply  | Kapasiti Berlesen<br>Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan<br>Date of Licence Issued |
|---|---|--|---|--|
| <b>Petronas Gas Berhad</b>                      |   |  |   |  |
| 165   | Level 49-51, Tower 1, Petronas Twin Towers<br>Kuala Lumpur City Centre, 50088 Kuala Lumpur.<br>Tel : 03-2051 5000 Faks : 03-2051 5885                                       | Sebahagian Kawasan Laut<br>Mukim Tangga Batu<br>Daerah Melaka Tengah, Melaka.                                      | 5.95  | 05-10-2012   |
| <b>Amtrustee Berhad</b>                         |   |  |   |  |
| 166   | CapitaMalls Malaysia Trust<br>Level 3, Jalan Putra Square 6<br>Putra Square, 25200 Kuantan, Pahang.<br>Tel : 09-565 8688 Faks : 09-565 8599                                 | East Coast Mall<br>Putra Square<br>Lot 423(PN 5596)<br>Mukim Kuantan<br>25000 Kuantan, Pahang.                     | 10.00                                       | 05-10-2012   |
| <b>Mines Waterfront Business Park Sdn. Bhd.</b> |   |  |   |  |
| 167   | Level 1, Block B, Mines Waterfront Business Park<br>No. 3, Jalan Tasik, The Mines Resort City<br>43300 Seri Kembangan, Selangor.<br>Tel : 03-8943 8811 Faks : 03-8943 1837  | Mines Waterfront Business Centre<br>Lot PT 16715<br>43300 Daerah Petaling<br>Selangor.                             | 4.80  | 11-12-2012   |
| <b>Mines 2 Sdn. Bhd.</b>                        |   |  |   |  |
| 168   | No.L-4-6E The Mines Shopping Fair<br>Jalan Dulang Mines Resort City<br>43300 Seri Kembangan, Selangor.<br>Tel : 03-8958 3773 Faks : 03-8942 5153                            | Mines 2 Mall<br>Lot 1584<br>Mukim Pekan Baru Sungai Besi<br>43300 Daerah Petaling<br>Selangor.                     | 3.20  | 12-12-2012   |
| <b>Nusajaya Lifestyle Sdn. Bhd.</b>             |   |  |   |  |
| 169   | 16-1, Mercu UEM, Jalan Stesen Sentral 5<br>Kuala Lumpur Sentral 5<br>50470 Kuala Lumpur<br>Tel : 03-2727 6000 Faks : 03-2727 2000   | Medini Lifestyle Mall<br>No. Lot PTD 170657 dan PTD<br>170658<br>Mukim Pulai<br>79200 Daerah Johor Baharu<br>Johor | 3.4   | 21-12-2012   |
| <b>GCH Retail (Malaysia) Sdn. Bhd.</b>          |   |  |   |  |
| 170   | GCH Retail (Malaysia) Sdn. Bhd.<br>Giant Hypermarket Cheng Melaka<br>Lot 2-13, Jalan TTC 9, Taman Technology Cheng<br>75250 Melaka.<br>Tel : 06-336 5519 Faks : 06-336 5517 | Giant Hypermarket Cheng Melaka<br>Lot 8519, Mukim Cheng<br>Daerah Melaka Tengah<br>Melaka.                         | 2.10  | 27-12-2012   |

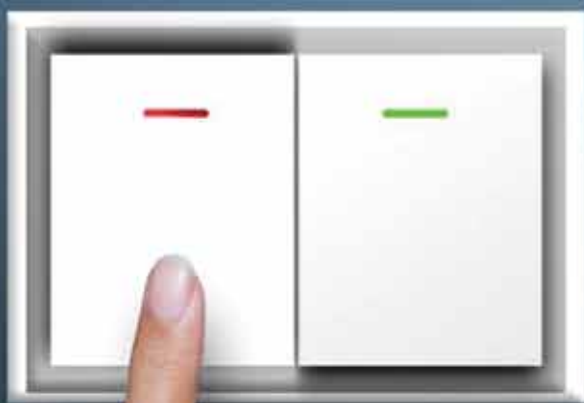
Nota | Note :

\* Menjana dan mengagih elektrik | Generating and distributing electricity



## MAKLUMAT DAN STATISTIK INDUSTRI DI SABAH *INDUSTRY INFORMATION AND STATISTICS IN SABAH*

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## Sabah Electricity Sdn. Bhd. (SESB)

Sabah Electricity Sdn. Bhd. (SESB)

Jadual 1: Sorotan Prestasi

Table 1: Performance Highlights

| Petunjuk I Indicator   | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| Kehendak Maksimum (MW)   Maximum Demand (MW)   | 673   | 719   | 780   | 830   | 828   |
| Jumlah Unit Penjanaan (GWj) <sup>1</sup><br>Total Units Generated (GWh)  | 1,489 | 1,317 | 1,178 | 1,524 | 1,294 |
| Jumlah Unit Jualan (GWj)   Total Units Sold (GWh)  | 3,474 | 3,855 | 4,127 | 4,275 | 4,456 |
| Hasil Jualan Elektrik (RM Juta)<br>Sales of Electricity (RM million)   | 836   | 975   | 1,055 | 1,155 | 1,350 |
| Kapasiti Penjanaan Terpasang (MW) <sup>2</sup><br>Installed Generation Capacity (MW)                           | 357   | 489   | 375   | 435   | 417   |
| Jumlah Kakitangan   Number of Employees  | 2,272 | 2,484 | 2,613 | 2,613 | 2,679 |
| Hasil Jualan Setiap Kakitangan (RM Juta/Kakitangan)<br>Sales of Electricity per Employee (RM Million/Employee) | 0.37  | 0.39  | 0.40  | 0.44  | 0.50  |
| Unit Jualan Setiap Kakitangan (GWj/Kakitangan)<br>Units Sold per Employee (GWh/Kakitangan)                     | 1.53  | 1.55  | 1.58  | 1.64  | 1.66  |
| Kapasiti Penjanaan Setiap Kakitangan (MW/Kakitangan)<br>Installed Capacity per Employee (MW/Employee)          | 0.16  | 0.20  | 0.14  | 0.17  | 0.16  |
| Jumlah Unit Pembelian (GWj)<br>Total Units Purchased (GWh)   | 2,788 | 3,235 | 3,648 | 3,765 | 3,843 |
| Jumlah Unit Eksport (GWj)   Total Units Exported (GWh)   | -     | -     | -     | -     | -     |
| Jumlah Unit Import (GWj)   Total Units Imported (GWh)  | -     | -     | -     | -     | -     |

Jadual 2: Kapasiti Terpasang (MW) dan Kebolehdapatan Keseluruhan (%)

Table 2: Installed Capacity (MW) and Overall Availability (%)

| Jenis Bahan Api   Fuel Type  | 2008         | 2009         | 2010         | 2011         | 2012         |
|--|--------------|--------------|--------------|--------------|--------------|
| Hidro   Hydro  | 74           | 74           | 74           | 70           | 68           |
| Gas Asli   Natural Gas   | 107          | 162          | 101          | 107          | 105          |
| Arang batu   Coal  | -            | -            | -            | -            | -            |
| Minyak   Medium Fuel Oil (MFO)   | -            | -            | -            | -            | -            |
| Disel   Diesel   | 176          | 253          | 200          | 259          | 245          |
| Lain-lain (Bekalan Elektrik Luar Bandar – Disel & Hidro Mini)<br>Others (Rural Electricity Supply – Diesel & Mini Hydro) | -            | -            | -            | -            | -            |
| <b>Jumlah   Total</b>  | <b>357</b>   | <b>489</b>   | <b>375</b>   | <b>435</b>   | <b>417</b>   |
| <b>Kebolehdapatan Keseluruhan (%)<br/>Overall Availability (%)</b>   | <b>73.30</b> | <b>64.90</b> | <b>57.00</b> | <b>57.00</b> | <b>70.75</b> |

**Jadual 3: Campuran Penjanaan (GWj)**

Table 3: Generation Mix (GWh)

| Jenis Bahan Api   Fuel Type    | 2008  | 2009  | 2010  | 2011  | 2012  |
|--------------------------------|-------|-------|-------|-------|-------|
| Hidro   Hydro                  | 489   | 393   | 482   | 754   | 377   |
| Gas Asli   Natural Gas         | 675   | 530   | 260   | 398   | 589   |
| Arang batu   Coal              | -     | -     | -     | 0     | 0     |
| Minyak   Medium Fuel Oil (MFO) | -     | -     | -     | 0     | 0     |
| Disel   Diesel                 | 325   | 394   | 436   | 372   | 328   |
| Jumlah   Total                 | 1,489 | 1,317 | 1,178 | 1,524 | 1,294 |

**Jadual 4: Jualan Tenaga Elektrik (GWj)**

Table 4: Sales of Electricity (GWh)

| Sektor   Sector              | 2008  | 2009  | 2010  | 2011  | 2012  |
|------------------------------|-------|-------|-------|-------|-------|
| Domestik   Domestic          | 1,090 | 1,204 | 1,295 | 1,332 | 1,436 |
| Komersil   Commercial        | 1,321 | 1,504 | 1,602 | 1,742 | 1,923 |
| Industri   Industry          | 1,017 | 1,099 | 1,178 | 1,146 | 1,038 |
| Lampu Awam   Public Lighting | 47    | 49    | 52    | 56    | 59    |
| Perlombongan   Mining        | -     | -     | -     | -     | -     |
| Eksport   Export             | -     | -     | -     | -     | -     |
| Jumlah   Total <sup>3</sup>  | 3,475 | 3,856 | 4,127 | 4,275 | 4,456 |

**Jadual 5: Bilangan Pengguna**

Table 5: Number of Consumers

| Sektor   Sector              | 2008    | 2009    | 2010    | 2011    | 2012    |
|------------------------------|---------|---------|---------|---------|---------|
| Domestik   Domestic          | 332,861 | 347,640 | 364,376 | 384,384 | 403,387 |
| Komersil   Commercial        | 62,012  | 65,551  | 68,877  | 72,288  | 75,375  |
| Industri   Industry          | 2,799   | 2,870   | 2,971   | 2,865   | 2,903   |
| Lampu Awam   Public Lighting | 3,918   | 4,117   | 4,302   | 4,516   | 4,820   |
| Perlombongan   Mining        | -       | -       | -       | -       | -       |
| Eksport   Export             | -       | -       | -       | -       | -       |
| Jumlah   Total               | 401,590 | 420,178 | 440,526 | 464,053 | 486,485 |

**Jadual 6: Keupayaan Sistem Penghantaran**

Table 6: Transmission System Capacity

| Talian/Kabel Sistem Penghantaran<br>Transmission System Lines/Cables | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| 500 kV (km)  | -     | -     | -     | -     | -     |
| 275 kV (km)  | 492   | 492   | 492   | 492   | 492   |
| 132 kV (km)  | 1,672 | 1,674 | 1,721 | 1,780 | 1,772 |
| 66 kV (km)   | 123   | 123   | 123   | 123   | 123   |
| <b>Pencawang Penghantaran   Transmission Substations</b>             |       |       |       |       |       |
| Bilangan   Number  | 34    | 36    | 39    | 41    | 42    |
| Keupayaan   Capacity (MVA)   | 3,793 | 3,913 | 4,517 | 4,652 | 4,672 |
| <b>Prestasi   Performance</b>  |       |       |       |       |       |
| Bilangan Kejadian Pelantikan<br>Number of Tripping Incidents         | 12    | 18    | 26    | 31    | 30    |
| Tenaga Yang Tidak Dibekal (MWj)<br>Unsupplied Energy (MWh)           | 162   | 318   | 513   | 804   | 3,738 |

**Jadual 7: Keupayaan Sistem Pengagihan**

Table 7: Distribution System Capacity

| Talian/Kabel Sistem Pengagihan<br>Distribution System Lines/Cables | 2008   | 2009   | 2010   | 2011   | 2012   |
|--|--------|--------|--------|--------|--------|
| Talian Atas   Overhead Lines (km) <sup>4</sup>                     | 6,431  | 7,420  | 7,490  | 7,761  | 8,525  |
| Kabel Bawah Tanah   Underground Cables (km) <sup>4</sup>           | 762    | 1,035  | 1,418  | 1,317  | 1,136  |
| <b>Pencawang Pengagihan   Distribution Substations</b>             |        |        |        |        |        |
| Bilangan   Number  | 5,214  | 5,614  | 5,815  | 5,878  | 6,365  |
| Keupayaan   Capacity (MVA)   | 4,179  | 4,235  | 4,618  | 4,813  | 5,864  |
| <b>Prestasi   Performance</b>                                      |        |        |        |        |        |
| Bilangan Gangguan Bekalan<br>Number of Supply Interruptions        | 21,911 | 24,969 | 24,169 | 23,397 | 27,409 |

## Nota | Note :

- Jumlah Unit Penjanaan (Jumlah Campuran Penjanaan) bagi SESB tidak termasuk IPPs di Sabah  
Total Units Generated (Generation Mix) for SESB excluding IPPs in Sabah
- Jumlah Kapasiti Penjanaan Terpasang SESB tidak termasuk IPPs di Sabah  
Installed Generation Capacity for SESB excluding IPPs in Sabah
- Jualan Tenaga Elektrik bagi SESB termasuk penjanaan sendiri oleh SESB dan tenaga dibeli dari IPPs di Sabah  
Sales of Electricity for SESB includes SESB own generation and energy purchased from IPPs in Sabah
- Sistem 33 kV dan 11kV sahaja  
33 kV dan 11kV system only

## Penjana-Penjana Kuasa Bebas (IPPs)

### Independent Power Producers (IPPs)

Jadual 8: Kapasiti Berlesen, Unit Penjanaan dan Unit Jualan

Table 8: Licensed Capacity, Units Generated and Units Sold

| No. | Pemegang Lesen & Lokasi<br>Licensee & Location     | Jenis Loji<br>Plant Type                                     | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Penjanaan (GWh)<br>Generation (GWh) | Unit Jualan (GWh)<br>Units Sold (GWh) |
|-----|--|--|--|-------------------------------------|---------------------------------------|
| 1   | <b>ARL Tenaga Sdn. Bhd.</b>                        |  |  |                                     |                                       |
|     | Melawa, Kota Kinabalu, Sabah                       | Enjin Diesel<br>Diesel Engine                                | 50.0   | 59.40                               | 56.11                                 |
| 2   | <b>Serudong Power Sdn. Bhd.</b>                    |  |  |                                     |                                       |
|     | Tawau, Sabah                                       | Enjin Diesel<br>Diesel Engine                                | 36.0   | 233.59                              | 225.65                                |
| 3   | <b>Stratavest Sdn. Bhd.</b>                        |  |  |                                     |                                       |
|     | Sandakan, Sabah                                    | Enjin Diesel<br>Diesel Engine                                | 60.0   | 145.70                              | 140.52                                |
| 4   | <b>Sandakan Power Power Corporation Sdn. Bhd.*</b> |  |  |                                     |                                       |
|     | Sandakan, Sabah                                    | Enjin Diesel<br>Diesel Engine                                | 34.1   | -                                   | -                                     |
| 5   | <b>Sepangar Bay Power Corporation Sdn. Bhd.</b>    |  |  |                                     |                                       |
|     | Kota Kinabalu, Sabah                               | Kitar Padu<br>Combined Cycle<br>Turbin Stim<br>Steam turbine | 100.0  | 666.09                              | 642.43                                |
| 6   | <b>Ranhill Powertron Sdn. Bhd.</b>                 |  |  |                                     |                                       |
|     | Kota Kinabalu, Sabah.                              | Kitar Padu<br>Combined Cycle                                 | 190.0  | 1,253.73                            | 1,216.48                              |
| 7   | <b>Ranhill Powertron II Sdn. Bhd.</b>              |  |  |                                     |                                       |
|     | Kota Kinabalu, Sabah                               | Kitar Padu<br>Combined Cycle                                 | 190.0  | 1,222.70                            | 1,183.74                              |

Nota I Note :

\* Lesen dibatalkan pada 29 Mei 2012 | License was revoked on the 29<sup>th</sup> of May 2012



## Projek-Projek Jana Kuasa Tenaga Boleh Baharu (TBB)

### Renewable Energy (RE) Power Projects

Jadual 9: Kapasiti Berlesen, Unit Penjanaan dan Unit Jualan  
Table 9: Licensed Capacity, Units Generated and Units Sold

| No. | Pemegang Lesen & Lokasi<br>Licensee & Location | Jenis Loji<br>Plant Type      | Bahan Api/<br>Pengerak<br>Fuel Type/Prime<br>Mover | Kapasiti<br>Berlesen<br>Licensed<br>Capacity<br>(MW) | Unit Penjanaan<br>(MWj)<br>Units<br>Generated<br>(MWh) | Unit Jualan<br>(MWj)<br>Unit Sold<br>(MWh) |
|-----|--|-------------------------------|--|--|--|--|
| 1   | <b>TSH Bio Energy Sdn. Bhd.</b>                |                               |  |  |  |  |
|     | Tawau, Sabah.                                  | Turbin Stim<br>Steam Turbines | Sisa Sawit<br>Palm Waste                           | 14.0   | 85,731.17  | 69,748.84                                  |
| 2   | <b>Seguntor Bioenergy Sdn. Bhd.</b>            |                               |  |  |  |  |
|     | Sandakan, Sabah.                               | Turbin Stim<br>Steam Turbines | Tandan Sawit<br>Kosong<br>Empty Fruit<br>Bunch     | 13.5   | 82,248.25  | 65,080.88                                  |
| 3   | <b>Kina Biopower Sdn. Bhd.</b>                 |                               |  |  |  |  |
|     | Sandakan, Sabah.                               | Turbin Stim<br>Steam Turbines | Tandan Sawit<br>Kosong<br>Empty Fruit<br>Bunch     | 11.5   | 50,558.08  | 41,825.11                                  |
| 4   | <b>Syarikat Esajadi Power Sdn. Bhd.</b>        |                               |  |  |  |  |
|     | Sg. Pangpuyan, Kota Marudu, Sabah.             | Mini Hidro<br>Mini Hydro      | Air<br>Water                                       | 4.5  | 13,066.01  | 11,694.01                                  |
| 5   | <b>Syarikat Esajadi Power Sdn. Bhd.</b>        |                               |  |  |  |  |
|     | Sungai Kadamaian, Kota Belud, Sabah.           | Mini Hidro<br>Mini Hydro      | Air<br>Water                                       | 2.0  | 10,219.52  | 10,219.52                                  |

## Co-Generators Utama

### Major Co-Generators

Jadual 10: Kapasiti Berlesen dan Unit Penjanaan (Lesen Awam)

Table 10: Licensed Capacity and Units Generated (Public Licence)

| No. | Pemegang Lesen & Lokasi<br><i>Licensee &amp; Location</i>             | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Bahan Api<br><i>Fuel Type</i>                   | Unit Penjanaan<br>(MWj)<br><i>Units Generated (MWh)</i> |
|-----|---|--|---|---|
| 1   | <b>Bio Fuel Asia Sdn. Bhd.*</b>                                       |  |   |   |
|     | Kunak, Lahad Datu, Sabah.   | 10.00  | Habuk Kayu   Wood Waste                         | n/a   |
| 2   | <b>Bahagaya Sdn. Bhd.</b>   |  |   |   |
|     | Merotai, Tawau, Sabah   | 3.00   | Tandan Sawit Kosong<br><i>Empty Fruit Bunch</i> | 15,167.62   |
| 3   | <b>IJM Biofuel Sdn. Bhd.</b>  |  |   |   |
|     | Sandakan, Sabah.  | 3.60   | Tandan Sawit Kosong<br><i>Empty Fruit Bunch</i> | n/a   |
| 4   | <b>IOI Bio-Energy Sdn. Bhd.</b>                                       |  |   |   |
|     | Sandakan, Sabah.  | 15.00  | Biojsim   Biomass                               | n/a   |
| 5   | <b>Petronas Methanol (Labuan) Sdn. Bhd.</b>                           |  |   |   |
|     | Kawasan Perindustrian Ranca-Ranca Labuan, Wilayah Persekutuan Labuan. | 41.80  | Gas Asli   <i>Natural Gas</i>                   | n/a   |
| 6   | <b>Profound Heritage Sdn. Bhd.</b>                                    |  |   |   |
|     | Kota Kinabalu, Sabah.   | 38.00  | Disel   <i>Diesel</i>                           | 101,197.20  |
| 7   | <b>Seo Energy Sdn. Bhd.</b>   |  |   |   |
|     | Karamunting, Sandakan, Sabah.   | 1.20   | Tandan Sawit Kosong<br><i>Empty Fruit Bunch</i> | 2,917.61  |
| 8   | <b>Evergreen Intermerge Sdn. Bhd.</b>                                 |  |   |   |
|     | Tanjung Batu Laut, Tawau, Sabah                                       | 6.00   | Tandan Sawit Kosong<br><i>Empty Fruit Bunch</i> | 4,575.14  |

Nota | Note :

\* Tiada aktiviti penjanaan | *No generation activity*

Jadual 11: Kapasiti Berlesen dan Unit Penjanaan (Lesen Persendirian)

Table 11: Licensed Capacity and Units Generated (Private Licence)

| No. | Pemegang Lesen & Lokasi<br><i>Licensee &amp; Location</i>        | Kapasiti Berlesen<br><i>Licensed Capacity (MW)</i> | Bahan Api<br><i>Fuel Type</i>                        | Unit Penjanaan<br>(MWj)<br><i>Units Generated (MWh)</i> |
|-----|--|--|--|---|
| 1   | <b>Felda Palm Industries Sdn. Bhd.</b>                           |  |  |   |
|     | Gugusan Felda Sahabat, Mukim Tungku Daerah Lahad Datu, Sabah.    | 7.50   | Tandan Sawit Kosong<br><i>Empty Fruit Bunch</i>      | 20,838.86   |
| 2   | <b>Palm Energy Sdn. Bhd.</b>                                     |  |  |   |
|     | No. Lot CL 115311138, Mukim Lahad Datu Daerah Lahad Datu, Sabah. | 6.50   | Bahan Buangan Pertanian<br><i>Agricultural Waste</i> | 10.89   |
| 3   | <b>Sabah Forest Industries Sdn. Bhd.</b>                         |  |  |   |
|     | Mukim Kg. Sebuuh Daerah Sipitang, Sabah.                         | 79.50  | Sisa Kayu / Disel<br><i>Wood Waste/Diesel</i>        | 320,666.81  |

## Penjanaan Persendirian Kurang daripada 5 MW

### Self-Generation Less than 5 MW

Jadual 12: Kapasiti Berlesen dan Unit Penjanaan  
Table 12: Licensed Capacity and Units Generated

| Jenis Bahan Api<br>Fuel Type          | Sektor   Sector                              | 2008   | 2009   | 2010     | 2011     | 2012   |
|---------------------------------------|--|--------|--------|----------|----------|--------|
|                                       | Bilangan Lesen   Number of Licences          | 881    | 955    | 969      | 1,002    | 971    |
| Gas                                   | Kapasiti Berlesen   Licensed Capacity (MW)   | 3.70   | 5.70   | 5.70     | 5.70     | -      |
|                                       | Unit Penjanaan (MWj)   Units Generated (GWh) | n/a    | 1,274  | 1,426    | 2,958    | -      |
| Disel<br>Diesel                       | Kapasiti Berlesen   Licensed Capacity (MW)   | 523    | 509    | 512      | 499      | 526    |
|                                       | Unit Penjanaan (MWj)   Units Generated (GWh) | n/a    | 111    | 99       | 68       | 67     |
| Sisa Sawit<br>Palm Oil Waste          | Kapasiti Berlesen   Licensed Capacity (MW)   | 108    | 119    | 115      | 122      | 123    |
|                                       | Unit Penjanaan (MWj)   Units Generated (GWh) | n/a    | 208    | 222      | 244      | 261    |
| Suria Fotovolta<br>Solar Photovoltaic | Kapasiti Berlesen   Licensed Capacity (MW)   | n/a    | n/a    | n/a      | n/a      | 1.41   |
|                                       | Unit Penjanaan (MWj)   Units Generated (GWh) | n/a    | n/a    | n/a      | n/a      | n/a    |
| Lain-Lain<br>Others                   | Kapasiti Berlesen   Licensed Capacity (MW)   | 3.66   | 1.41   | 7.13     | 7.13     | 9.78   |
|                                       | Unit Penjanaan (MWj)   Units Generated (GWh) | 0.00   | 135.08 | 7,085.39 | 9,260.69 | n/a    |
| Jumlah<br>Total                       | Kapasiti Berlesen   Licensed Capacity (MW)   | 638.11 | 635.63 | 640.50   | 634.21   | 659.86 |
|                                       | Unit Penjanaan (MWj)   Units Generated (GWh) | 0.00   | 321.36 | 329.50   | 324.83   | 327.99 |

**Nota | Note :**

Lain-lain termasuk lain-lain jenis biojisim (Hampas Padi, Hampas Tebu, Habuk Kayu, Cip Kayu) dan Biogas  
Others including other types of biomass (Paddy Husk, Bagasse, Wood Dust, Wood Chips) and Biogas

## Senarai Pengagih-Pengagih Elektrik

### List of Electricity Distributors

Jadual 13: Senarai Pengagih-Pengagih Elektrik  
Table 13: List of Electricity Distributors

| No. | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address   | Kawasan Bekalan<br>Area of Supply  | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Tarikh Lesen<br>Dikeluarkan<br>Date of Licence<br>Issued |
|-----|---|--|--|--|
| 1   | <b>K.K.I.P. Power Sdn. Bhd.</b>   |  |  |  |
|     | Lot A7, Salut Commercial Centre<br>Kota Kinabalu Industrial Park, Jalan Politeknik<br>88460 Kota Kinabalu, Sabah.<br>Tel : 088-497 801 / 497 802 Faks : 088-498 177 | Kota Kinabalu Industrial Park (KKIP)<br>Sabah.   | 210.00   | 15-06-1998   |
| 2   | <b>Profound Heritage Sdn. Bhd.</b>  |  |  |  |
|     | 1 <sup>st</sup> Floor, Lorong Grace Square<br>Jalan Pantai Sembulan, 88100 Kota Kinabalu,<br>Sabah.<br>Tel : 088-318 801 / 318 802 Faks : 088-233 362               | Sutera Harbour Resort<br>Lot 2, LA. 93010260<br>Kota Kinabalu<br>Sabah.  | 38.00  | 01-10-2006   |
| 3   | <b>Evergreen Intermerge Sdn. Bhd.</b>   |  |  |  |
|     | Teck Guan Regency, 318 Jalan St Patrick<br>Off Jalan Belunu, Peti Surat 33, 91007 Tawau,<br>Sabah.<br>Tel : 089-758 955 Faks : 089-760 955                          | Cacao Paramount Sdn. Bhd.<br>Lot CL 105323797, Km 3<br>Tanjung Batu Laut, Tawau<br>Sabah.  | 6.00   | 10-10-2006   |
| 4   | <b>Seo Energy Sdn. Bhd.</b>   |  |  |  |
|     | KM 8, Jalan Batu Sapi, Karamunting, P.O. Box<br>2605<br>90729 Sandakan, Sabah.<br>Tel : 089-611 011 / 611 012<br>Faks : 089-611 014 / 617 355                       | Lot No. 077533754<br>KM 8, Jalan Batu Sapi<br>Karamunting<br>Sabah.  | 1.20   | 10-10-2006   |
| 5   | <b>Asian Supply Base Sdn. Bhd.</b>  |  |  |  |
|     | Ranca-Ranca Industrial Estate, P.O. Box 80751<br>87017 Labuan Federal Territory, Sabah.<br>Tel : 087-411 611 / 411 614 Faks : 087-415 477                           | Asian Supply Base<br>Lot 206291581, Daerah Labuan<br>Wilayah Persekutuan Labuan<br>Sabah.  | 12.00  | 13-11-2006   |
| 6   | <b>TSH-WILMAR (BF) Sdn. Bhd.</b>  |  |  |  |
|     | Bangunan TSH, TB9, KM 7<br>Apas Road, 91000 Tawau, Sabah.<br>Tel : 089-912 020 / 911 056 Faks : 089-913 000   | TSH Edible Oils Sdn Bhd<br>PL 26166110 & 246290228<br>Kunak, Lahad Datu, Sabah.  | 10.00  | 29-12-2006   |
| 7   | <b>Eksons Biomass Energy Sdn. Bhd.</b>  |  |  |  |
|     | TB 4327, 2 <sup>nd</sup> Floor<br>Block 31, Fajar Complex<br>Jalan Haji Karim, 91000 Tawau, Sabah.<br>Tel : 089-757 911 / 757 913 Faks : 089-761 022                | Rajang Plywood (Sabah) Sdn. Bhd.<br>CLS 105486762, 105486771 dan<br>PT2000100538 Sungai Umas,<br>Umas Mukim Merotai,<br>Tawau 91000 Sabah. | 3.00   | 07-03-2007   |
| 8   | <b>Petronas Methanol (Labuan) Sdn. Bhd.</b>   |  |  |  |
|     | Kawasan Perindustrian Ranca-Ranca<br>P.O. Box No. 80079,<br>87010 Wilayah Persekutuan Labuan.<br>Tel : 087-411 211 Faks : 087-413 921 / 425 831                     | Kawasan Perindustrian Ranca-Ranca<br>Labuan<br>87010 Wilayah Persekutuan Labuan.   | 41.80  | 18-07-2007   |
| 9   | <b>1Borneo Management Corporation Sdn. Bhd.</b>   |  |  |  |
|     | G-600A, Ground Floor, 1Borneo Hypermall<br>Jalan Sulaman<br>88400 Kota Kinabalu, Sabah.<br>Tel : 088-447 744 Faks : 088-447 743                                     | Kompleks Beli-Belah 1 Borneo<br>Hypermall<br>CL 015607057<br>Mukim Kuala Menggatal<br>Dearah Kota Kinabalu<br>88450 Sabah.                 | 20.00  | 08-04-2008   |

| No. | Pemegang Lesen & Alamat Perhubungan Licensee & Contact Address  | Kawasan Bekalan Area of Supply  | Kapasiti Berlesen Licensed Capacity (MW) | Tarikh Lesen Dikeluarkan Date of Licence Issued |
|-----|---|---|--|---|
| 10  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |  |   |
|     | Giant Superstore Sandakan, Lot 3, Jalan IJM Bandar Utama, Batu 6, Off Jalan Utara, 90000 Sandakan, Sabah.<br>Tel : 089-214 219 Faks : 089-214 207                                       | Lot CL075477584<br>Mukim Sandakan<br>Daerah Sandakan<br>Sabah.  | 1.70                                     | 17-11-2008                                      |
| 11  | <b>IJM Biofuel Sdn. Bhd.</b>  |   |  |   |
|     | Wisma IJM Plantations<br>Lot 1, Jalan Bandar Utama, Batu 6, Jalan Utara 90000 Sandakan<br>Sabah.<br>Tel : 089-667 721 Faks : 089-674 810  | IJM Edible Oils Sdn. Bhd.<br>IJMP Integrated Downstream Processing Complex<br>Lot NT. 073019299<br>Mukim Sungai Mowtas<br>Daerah Sandakan, Poskod 90009<br>Sabah. | 3.60                                     | 18-06-2009                                      |
| 12  | <b>GCH Retail (Malaysia) Sdn. Bhd.</b>  |   |  |   |
|     | Giant Complex Tawau<br>CL105466055, KM 5 1/2, Jalan Chong Thien Yun Off Jalan Apas, 91000 Tawau, Sabah.<br>Tel : 089-911 890 Faks : 089-911 891   | Giant Hypermarket<br>Lot CL105466055<br>Jalan Datuk Chong Fuen Yun<br>91000 Tawau, Sabah.   | 3.00                                     | 10-07-2009                                      |
| 13  | <b>Makamewah Sdn. Bhd.</b>  |   |  |   |
|     | 9 <sup>th</sup> Floor, 9-3, Suria Sabah Shopping Mall 1, Jalan Tun Fuad Stephens<br>88000 Kota Kinabalu, Sabah.<br>Tel : 088-238 949 Faks : 088-239 040                                 | Suria Sabah Shopping Mall<br>Lot T.L. 017539810<br>Mukim Kota Kinabalu<br>Daerah Kota Kinabalu<br>Sabah.  | 13.00                                    | 27-08-2009                                      |
| 14  | <b>IOI Bio-Energy Sdn. Bhd.</b>   |   |  |   |
|     | Level 8, Two IOI Square<br>IOI Resort<br>62502 Putrajaya<br>Tel : 03-8947 8888 Faks : 03-8947 8686  | IOI Edible Oils Sdn. Bhd.<br>IOI Integrated Edible Oils Processing Complex<br>Mukim Sungai Mowtas<br>Daerah Sandakan<br>90738 Sabah.                              | 15.00                                    | 20-01-2010                                      |
| 15  | <b>TSH Bio-Gas Sdn. Bhd.</b>  |   |  |   |
|     | Bangunan TSH, TB 9, KM7, Apas Road<br>91000 Tawau, Sabah.<br>Tel : 089-912 020 / 911 056 Faks : 089-913 000   | Lot CL 105392989<br>Mukim Kalumpang<br>Daerah Tawau<br>91000 Sabah.   | 3.00                                     | 11-03-2010                                      |
| 16  | <b>SEH POWER SDN. BHD.</b>  |   |  |   |
|     | No. 2A, 2 <sup>nd</sup> Floor, NKE Building<br>Lorong Kacang Tanah, Jalan Kolombong Off Mile 5 1/2, Jalan Tuaran<br>88450 Kota Kinabalu, Sabah.<br>Tel : 088-426 322 Faks : 088-424 215 | Sandakan Education Hub<br>Lot 01 to 25<br>Mukim Sungai Batang<br>Daerah Sandakan<br>Sabah.  | 45.00                                    | 11-03-2010                                      |
| 17  | <b>Felda Engineering Services Sdn. Bhd.</b>   |   |  |   |
|     | Tingkat 6, Balai Felda<br>Jalan Gurney Satu, 54000 Kuala Lumpur.<br>Tel : 03-2693 5211 / 089-811 130 Faks: 03-2693 6717   | Gugusan Felda Umas<br>Umas 1, 2, 3 & 4<br>Mukim Umas, Daerah Tawau<br>Sabah.  | 2.60                                     | 31-03-2010                                      |
| 18  | <b>Felda Engineering Services Sdn. Bhd.</b>   |   |  |   |
|     | Tingkat 6, Balai Felda<br>Jalan Gurney Satu<br>54000 Kuala Lumpur.<br>Tel : 03-2693 5211 / 089-811 130 Faks: 03-2693 6717   | Gugusan Felda Sahabat<br>Lot Sahabat 01-54<br>Mukim Sahabat<br>Daerah Lahad Datu, Sabah.  | 23.94                                    | 31-03-2010                                      |

| No.   | Pemegang Lesen & Alamat Perhubungan<br>Licensee & Contact Address  | Kawasan Bekalan<br>Area of Supply   | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Tarikh Lesen<br>Dikeluarkan<br>Date of Licence<br>Issued |
|---|--|---|--|--|
| <b>Felda Engineering Services Sdn. Bhd.</b> |  |   |  |  |
| 19  | Tingkat 6, Balai Felda<br>Jalan Gurney Satu<br>54000 Kuala Lumpur.<br>Tel : 03-2693 5211 / 089-811 130 Faks: 03-2693 6717  | Gugusan Felda Kalabakan<br>Kalabakan Tengah 01 & 02<br>Kalabakan Utara Dan Kalabakan<br>Selatan<br>Mukim Kalabakan, Daerah Tawau<br>Sabah.  | 1.55   | 31-03-2010   |
| <b>Untung Ria Sdn. Bhd.</b>                 |  |   |  |  |
| 20  | 11 <sup>th</sup> Floor, Wisma Perindustrian<br>Jalan Istiadat, Likas, 88400 Kota Kinabalu, Sabah.<br>Tel : 088-242 257 / 242 258 Faks : 088-242 169                                    | Lot No. CL 135193752 dan CL<br>135366139<br>Kg. Ulu Patikang, Keningau<br>Sabah.  | 4.00   | 09-08-2010   |
| <b>C3 Power Sdn. Bhd.</b>                   |  |   |  |  |
| 21  | 2 <sup>nd</sup> Floor, U0271, Block F, Jati Commercial Centre<br>P.O. Box 80737, 87017 F.T. Labuan.<br>Tel : 087-411 175 Faks : 087-419 731  | Temporary Settlement in some<br>areas in W. Persekutuan Labuan<br>Daerah Kota Kinabalu and Sandakan<br>Sabah.   | 5.85   | 26-08-2010   |
| <b>Suara Wira Sdn. Bhd.</b>                 |  |   |  |  |
| 22  | Ground Floor, Lot 3<br>Blk. E, Donggongan New Township, Penampang<br>89500 Kota Kinabalu, Sabah.<br>Tel : 088-712 792 Faks : 088-710 792   | Lot TL 217501874 & TL 217502086<br>Mukim Donggongan New Township<br>Daerah Penampang<br>Sabah.  | 4.05   | 27-09-2010   |
| <b>Malaysia Airports Sdn. Bhd.</b>          |  |   |  |  |
| 23  | Lapangan Terbang Antarabangsa Kota Kinabalu<br>Pejabat Pengurusan, Aras 5 Bangunan Terminal<br>Beg Berkunci 134<br>88740 Kota Kinabalu, Sabah.<br>Tel : 088-325 555 Faks : 088-325 511 | Lapangan Terbang Antarabangsa<br>Kota Kinabalu<br>Lot PT 92010207, TK1, TK2 & TK3,<br>Mukim Kota Kinabalu dan PT<br>92210081<br>Mukim Penampang, Daerah Kota<br>Kinabalu, Sabah.      | 5.50   | 03-11-2010   |
| <b>Malaysia Airports Sdn. Bhd.</b>          |  |   |  |  |
| 24  | Lapangan Terbang Tawau<br>P.O. Box 60132, 91011 Tawau, Sabah.<br>Tel : 089-950 777 Faks : 089-950 781  | Lapangan Terbang Tawau<br>Lot TK1, Mukim Apas Balong<br>Daerah Tawau, Sabah.  | 2.50   | 03-11-2010   |
| <b>Malaysia Airports Sdn. Bhd.</b>          |  |   |  |  |
| 25  | Lapangan Terbang Sandakan<br>P.O. Box 730, 90009 Sandakan, Sabah.<br>Tel : 089-667 784 Faks : 089-667 778  | Lapangan Terbang Sandakan<br>Lot TK1, Mukim Sandakan<br>Daerah Sandakan, Sabah.   | 2.50   | 03-11-2010   |
| <b>ICSD Ventures Sdn. Bhd.</b>              |  |   |  |  |
| 26  | Harbour Mall Sandakan, Management Office<br>Level 5, Sandakan Harbour Square<br>90000 Sandakan, Sabah.<br>Tel : 089-276 888 Faks : 089-276 999   | No. Lot T.L. 077579394<br>Daerah Sandakan<br>Sabah.   | 4.00   | 08-06-2011   |
| <b>Sagajuta (Sabah) Sdn. Bhd.</b>           |  |   |  |  |
| 27  | Lot No. CL.015080145 dan CL.015026392<br>Mukim Kuala Menggatal<br>Daerah Kota Kinabalu<br>Sabah.<br>Tel : 088-447 722 / 447 288<br>Faks : 088-447 272 / 447 788                        | Bangunan Parcel 1 Phase 1 Shoplex<br>(Tingkat Bawah - Tingkat 2,<br>106 unit)<br>No. Lot CL. 015080145 dan<br>CL.015026392<br>Mukim Kuala Menggatal<br>Daerah Kota Kinabalu<br>Sabah. | 3.22   | 30-04-2012   |

Nota | Note :

\* Menjana dan mengagih elektrik | Generating and distributing electricity



# MAKLUMAT DAN STATISTIK INDUSTRI DI SARAWAK

## INDUSTRY INFORMATION AND STATISTICS IN SARAWAK

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**107** Sarawak Energy Berhad (SEB)  
*Sarawak Energy Berhad (SEB)*

**109** Penjana-Penjana Kuasa Bebas (IPPs)  
*Independent Power Producers (IPPs)*



## Sarawak Energy Berhad (SEB)

### Sarawak Energy Berhad (SEB)

Jadual 1: Sorotan Prestasi

Table 1: Performance Highlights

| Petunjuk I Indicator   | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| Kehendak Maksimum (MW)   Maximum Demand (MW)   | 860   | 996   | 1,091 | 1,278 | 1,229 |
| Jumlah Unit Penjanaan (GWj) <sup>1</sup><br>Total Units Generated (GWh)  | 2,555 | 2,234 | 2,321 | 7,279 | 7,025 |
| Jumlah Unit Jualan (GWj)   Total Units Sold (GWh) <sup>3</sup>   | 4,421 | 4,540 | 5,728 | 6,486 | 7,587 |
| Hasil Jualan Elektrik (RM Juta)<br>Sales of Electricity (RM million)   | 1,289 | 1,342 | 1,518 | 1,673 | 1,862 |
| Kapasiti Penjanaan Terpasang (MW) <sup>2</sup><br>Installed Generation Capacity (MW)                           | 546   | 530   | 530   | 1,358 | 1,352 |
| Jumlah Kakitangan   Number of Employees  | 2,143 | 2,212 | 2,242 | 3,529 | 3,882 |
| Hasil Jualan Setiap Kakitangan (RM Juta/Kakitangan)<br>Sales of Electricity per Employee (RM Million/Employee) | 0.60  | 0.61  | 0.68  | 0.47  | 0.48  |
| Unit Jualan Setiap Kakitangan (GWj/Kakitangan)<br>Units Sold per Employee (GWh/Kakitangan)                     | 2.06  | 2.05  | 2.55  | 1.84  | 1.95  |
| Kapasiti Penjanaan Setiap Kakitangan (MW/Kakitangan)<br>Installed Capacity per Employee (MW/Employee)          | 0.25  | 0.24  | 0.24  | 0.38  | 0.35  |
| Jumlah Unit Pembelian (GWj)<br>Total Units Purchased (GWh)   | 2,851 | 3,643 | 4,672 | 759   | 2,712 |
| Jumlah Unit Eksport (GWj)   Total Units Exported (GWh)   | -     | -     | -     | -     | -     |
| Jumlah Unit Import (GWj)   Total Units Imported (GWh)  | -     | -     | -     | -     | -     |

Jadual 2: Kapasiti Terpasang (MW)

Table 2: Installed Capacity (MW)

| Jenis Bahan Api   Fuel Type    | 2008 | 2009 | 2010 | 2011  | 2012  |
|--------------------------------|------|------|------|-------|-------|
| Hidro   Hydro                  | 101  | 101  | 101  | 101   | 101   |
| Gas Asli   Natural Gas         | 271  | 271  | 271  | 675   | 608   |
| Arang batu   Coal              | -    | -    | -    | 480   | 480   |
| Minyak   Medium Fuel Oil (MFO) | -    | -    | -    | -     | -     |
| Disel   Diesel                 | 174  | 158  | 158  | 102   | 163   |
| Lain-lain   Others             | -    | -    | -    | -     | -     |
| Jumlah   Total                 | 546  | 530  | 530  | 1,358 | 1,352 |

Jadual 3: Campuran Penjanaan (GWj)

Table 3: Generation Mix (GWh)

| Jenis Bahan Api   Fuel Type    | 2008  | 2009  | 2010  | 2011  | 2012  |
|--------------------------------|-------|-------|-------|-------|-------|
| Hidro   Hydro                  | 527   | 461   | 542   | 424   | 433   |
| Gas Asli   Natural Gas         | 1,672 | 1,479 | 1,516 | 3,243 | 2,777 |
| Arang batu   Coal              | -     | -     | -     | 3,368 | 3,037 |
| Minyak   Medium Fuel Oil (MFO) | -     | -     | -     | -     | -     |
| Disel   Diesel                 | 356   | 294   | 263   | 244   | 778   |
| Lain-lain   Others             | -     | -     | -     | -     | -     |
| Jumlah   Total                 | 2,555 | 2,234 | 2,321 | 7,279 | 7,025 |

**Jadual 4: Jualan Tenaga Elektrik (GWj)**

Table 4: Sales of Electricity (GWh)

| Sektor   Sector              | 2008  | 2009  | 2010  | 2011  | 2012  |
|------------------------------|-------|-------|-------|-------|-------|
| Domestik   Domestic          | 1,132 | 1,249 | 1,335 | 1,423 | 1,584 |
| Komersil   Commercial        | 1,497 | 1,623 | 1,735 | 1,846 | 2,026 |
| Industri   Industry          | 1,726 | 1,606 | 2,593 | 3,151 | 3,904 |
| Lampu Awam   Public Lighting | 66    | 62    | 64    | 66    | 73    |
| Perlombongan   Mining        | -     | -     | -     | -     | -     |
| Eksport   Export             | -     | -     | -     | -     | -     |
| Lain-lain   Others           | -     | -     | -     | -     | -     |
| Jumlah   Total <sup>3</sup>  | 4,421 | 4,540 | 5,728 | 6,486 | 7,587 |

**Jadual 5: Bilangan Pengguna**

Table 5: Number of Consumers

| Sektor   Sector              | 2008    | 2009    | 2010    | 2011    | 2012    |
|------------------------------|---------|---------|---------|---------|---------|
| Domestik   Domestic          | 391,875 | 406,119 | 424,550 | 444,340 | 461,422 |
| Komersil   Commercial        | 67,480  | 70,040  | 72,921  | 76,222  | 79,278  |
| Industri   Industry          | 900     | 905     | 923     | 947     | 970     |
| Lampu Awam   Public Lighting | 6,149   | 6,507   | 6,811   | 7,042   | 7,383   |
| Perlombongan   Mining        | -       | -       | -       | -       | -       |
| Lain-lain   Others           | -       | -       | -       | -       | -       |
| Jumlah   Total               | 466,404 | 483,571 | 505,205 | 528,551 | 549,053 |

**Jadual 6: Keupayaan Sistem Penghantaran**

Table 6: Transmission System Capacity

| Talian/Kabel Sistem Penghantaran<br>Transmission System Lines/Cables | 2008  | 2009  | 2010  | 2011  | 2012  |
|--|-------|-------|-------|-------|-------|
| 500 kV (km)  | -     | -     | -     | -     | -     |
| 275 kV (km)  | 765   | 765   | 765   | 867   | 1026  |
| 132 kV (km)  | 138   | 225   | 225   | 235   | 386   |
| 66 kV (km)   | -     | -     | -     | -     | -     |
| Pencawang Penghantaran   Transmission Substations                    |       |       |       |       |       |
| Bilangan   Number  | 22    | 23    | 24    | 22    | 25    |
| Keupayaan   Capacity (MVA)   | 4,726 | 4,806 | 4,886 | 5,206 | 5,876 |
| Prestasi   Performance   |       |       |       |       |       |
| Bilangan Kejadian Pelantikan   Number of Tripping Incidents          | 9     | 4     | 7     | 8     | 16    |
| Tenaga Yang Tidak Dibekal (MWj)   Unsupplied Energy (MWh)            | 662   | 57    | 191   | 507   | 421   |

**Jadual 7: Keupayaan Sistem Pengagihan**

Table 7: Distribution System Capacity

| Talian/Kabel Sistem Pengagihan<br>Distribution System Lines/Cables | 2008   | 2009   | 2010   | 2011   | 2012   |
|--|--------|--------|--------|--------|--------|
| Talian Atas   Overhead Lines (km)                                  | 18,565 | 19,147 | 19,803 | 20,254 | 21,030 |
| Kabel Bawah Tanah   Underground Cables (km)                        | 5,422  | 5,709  | 6,087  | 6,450  | 6,680  |
| <b>Pencawang Pengagihan   Distribution Substations</b>             |        |        |        |        |        |
| Bilangan   Number  | 8,290  | 8,500  | 8,685  | 9,130  | 9,588  |
| Keupayaan   Capacity (MVA)   | 6,217  | 3,218  | 3,321  | 3,490  | 3,744  |
| <b>Prestasi   Performance</b>                                      |        |        |        |        |        |
| Bilangan Gangguan Bekalan   Number of Supply Interruptions         | 8,124  | 7,868  | 8,003  | 7,759  | 7,507  |

Nota | Note :

- Jumlah Unit Penjana (Jumlah Campuran Penjana) bagi SEB tidak termasuk IPPs di Sarawak  
Generation Mix for SEB excluding IPPs in Sarawak
- Jumlah Kapasiti Penjana Terpasang SEB tidak termasuk IPPs di Sarawak  
Installed Generation Capacity for SEB excluding IPPs in Sarawak
- Jualan Tenaga Elektrik bagi SEB termasuk penjana sendiri oleh SEB dan tenaga dibeli dari IPPs di Sarawak  
Sales of Electricity for SEB includes SEB own generation and energy purchased from IPPs in Sarawak

Maklumat bagi SEB mengambil kira penstrukturan semula SEB pada tahun 2011  
Information on SEB taking into account SEB's restructuring in 2011

**Penjana-Penjana Kuasa Bebas (IPPs)***Independent Power Producers (IPPs)***Jadual 8: Kapasiti Berlesen, Unit Penjana dan Unit Jualan**

Table 8: Licensed Capacity, Units Generated and Units Sold

| No. | Pemegang Lesen & Lokasi<br>Licensee & Location | Jenis Loji<br>Plant Type | Kapasiti Berlesen<br>Licensed Capacity<br>(MW) | Unit Penjana<br>(GWh)<br>Unit Generated<br>(GWh) | Unit Jualan (GWh)<br>Units Sold (GWh) |
|-----|--|--------------------------|--|--|---------------------------------------|
| 1   | <b>Sarawak Hydro Sdn. Bhd.</b>                 |                          |  |  |                                       |
|     | Bakun, Sarawak                                 | Hidro   Hydro            | 2,400  | 2,745  | 2,712                                 |

Nota | Note :

Bakun dimiliki dan dikendalikan oleh sebuah entiti di bawah kerajaan persekutuan, Sarawak Hidro Sdn. Bhd. Pada tahun 2012, Bakun beroperasi dengan Jumlah Kapasiti Terpasang sebanyak 1,200 MW dari jumlah keseluruhan kapasiti berlesen 2,400 MW

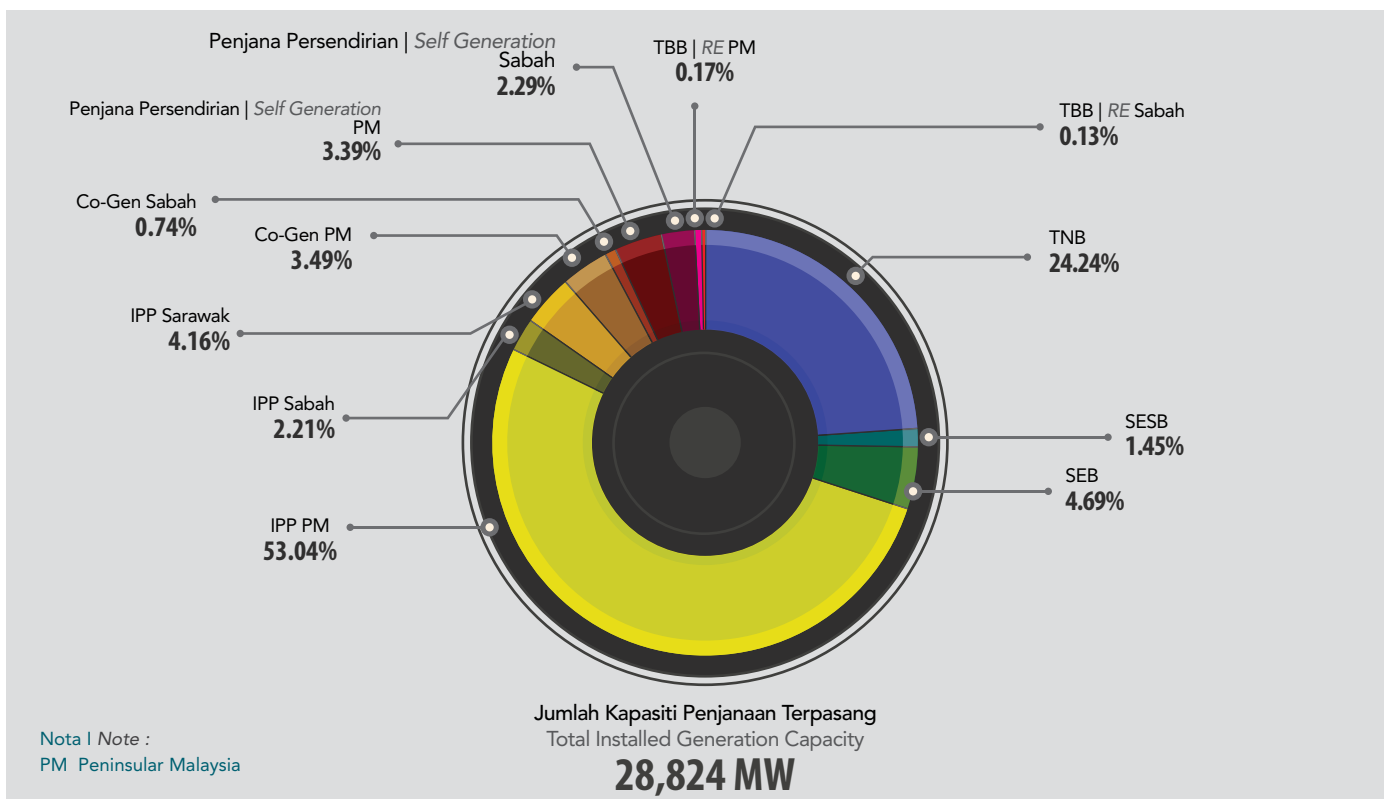
Bakun is owned and operated by an entity under the federal government namely Sarawak Hidro Sdn. Bhd. In 2012, Bakun operated at a total installed capacity of 1,200 MW out of the total licensed capacity of 2,400 MW



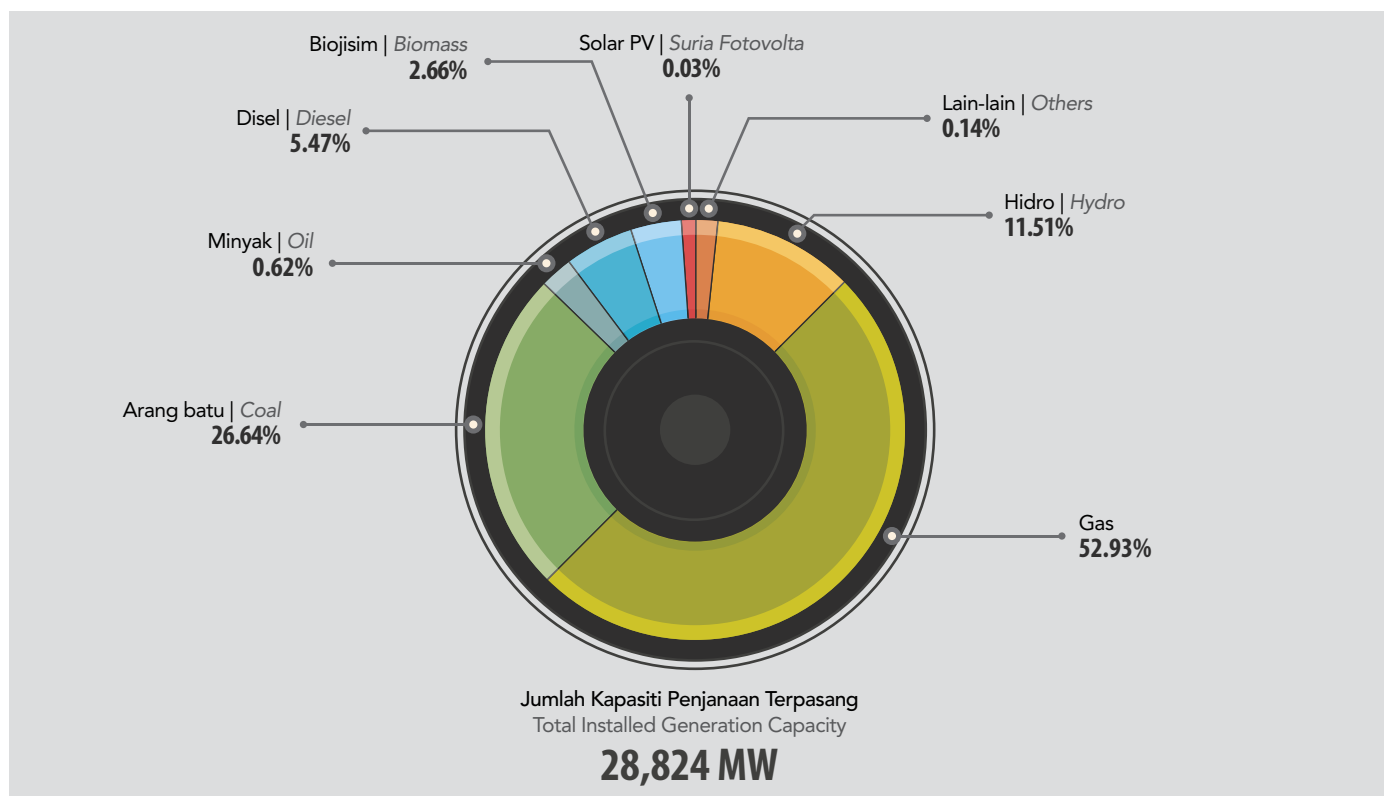
**RINGKASAN INDUSTRI PEMBEKALAN  
ELEKTRIK DI MALAYSIA**  
*SUMMARY OF ELECTRICITY SUPPLY  
INDUSTRY IN MALAYSIA*

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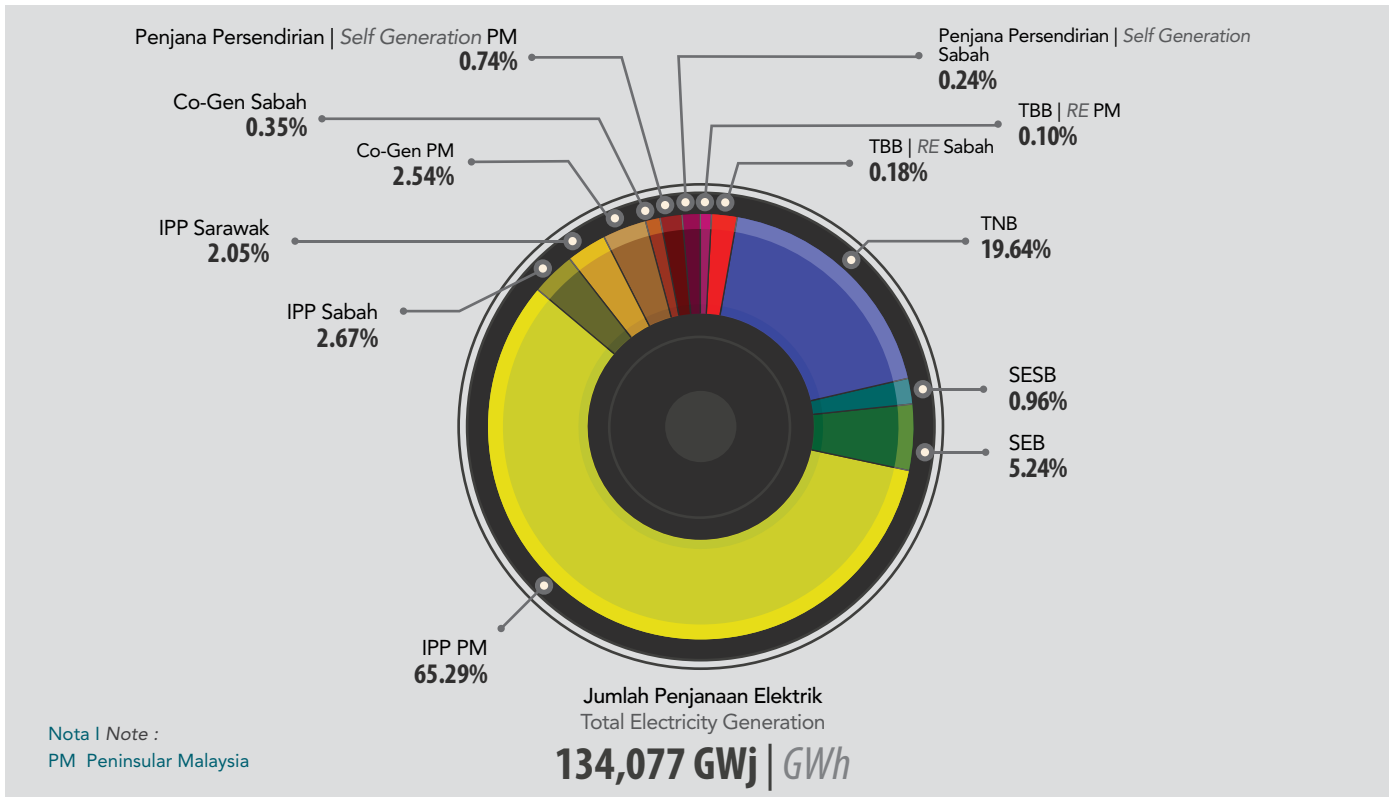
## Kapasiti Penjana Penjana-Penjana Kuasa Utama Generation Capacity by Major Power Producers



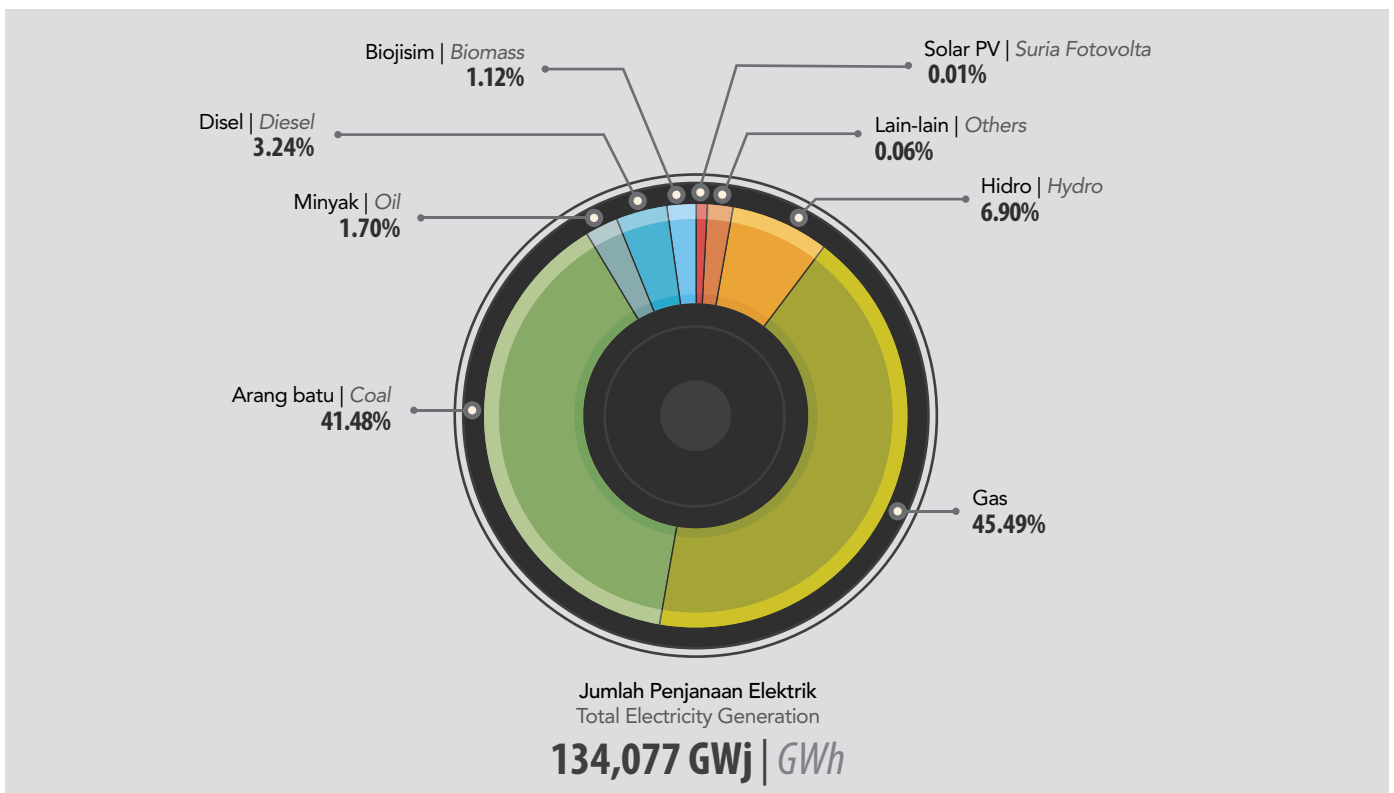
## Kapasiti Penjana Mengikut Jenis Bahan Api Generation Capacity by Fuel Type



### Campuran Penjanaan Penjana-Penjana Kuasa Utama Generation Mix by Major Power Producers



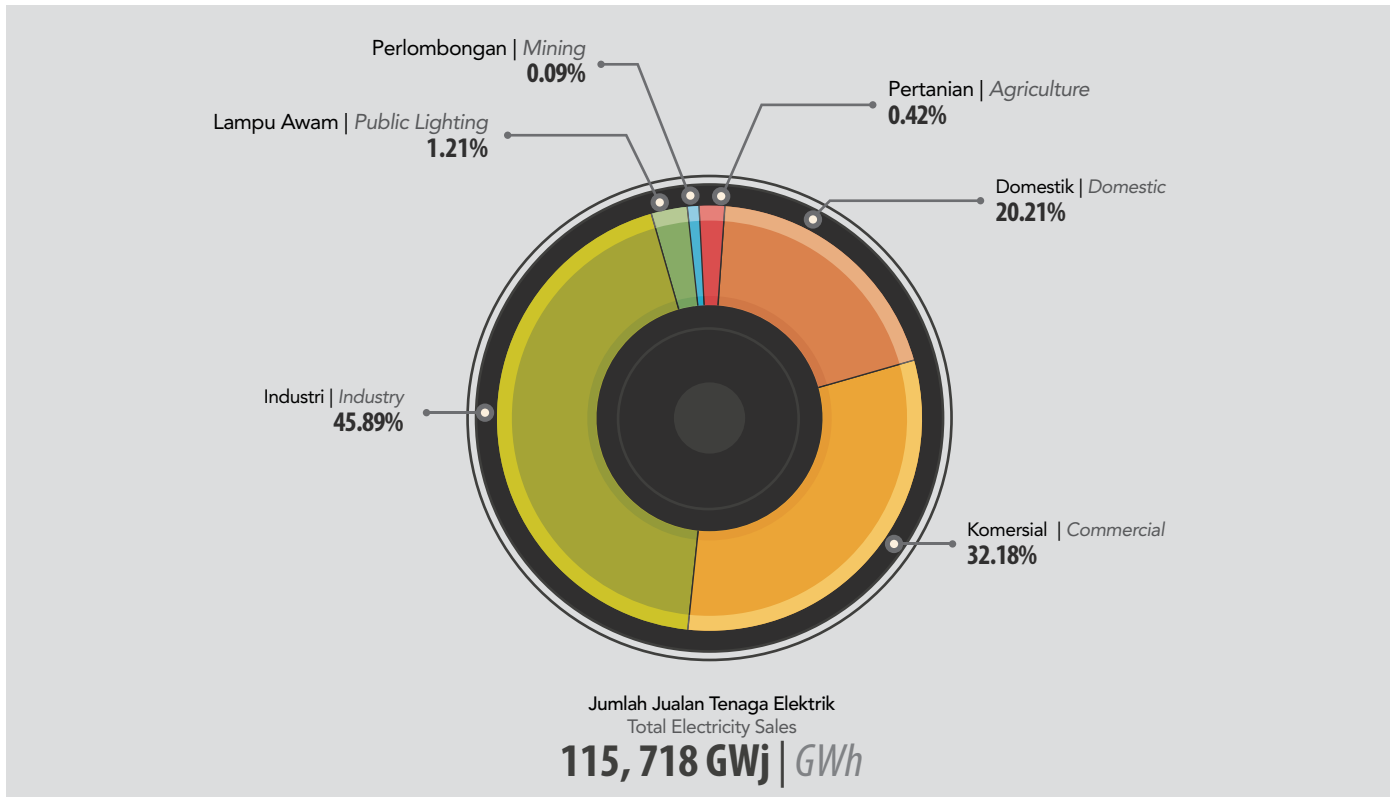
### Campuran Penjanaan Mengikut Jenis Bahan Api Generation Mix by Fuel Type





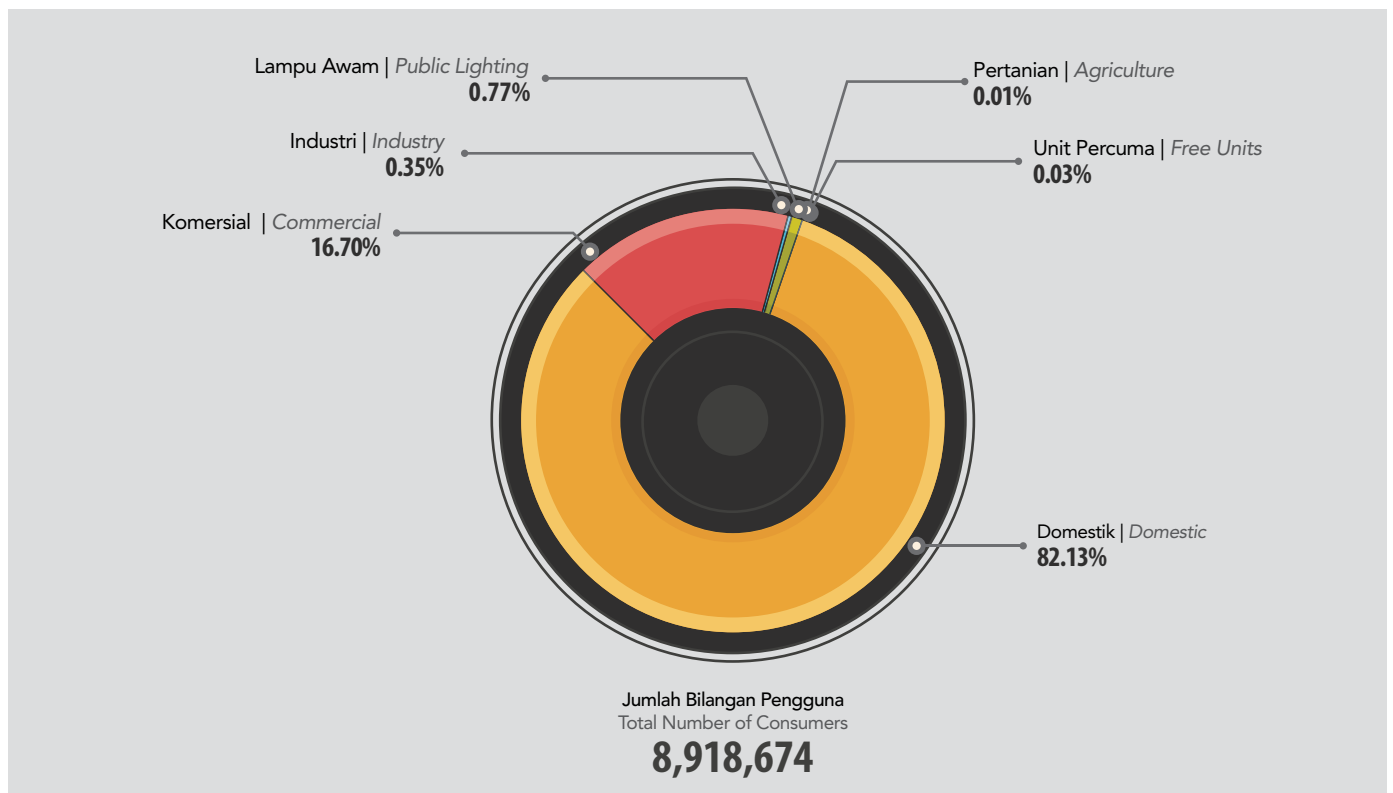
## Penggunaan Tenaga Elektrik Mengikut Sektor

Electricity Consumption by Sector



## Bilangan Pengguna

Number of Consumers







## PETA LOKASI STESEN-STESEN JANA KUASA UTAMA DAN SISTEM GRID DI MALAYSIA

### LOCATION MAP OF MAJOR POWER STATIONS AND GRID SYSTEM IN MALAYSIA

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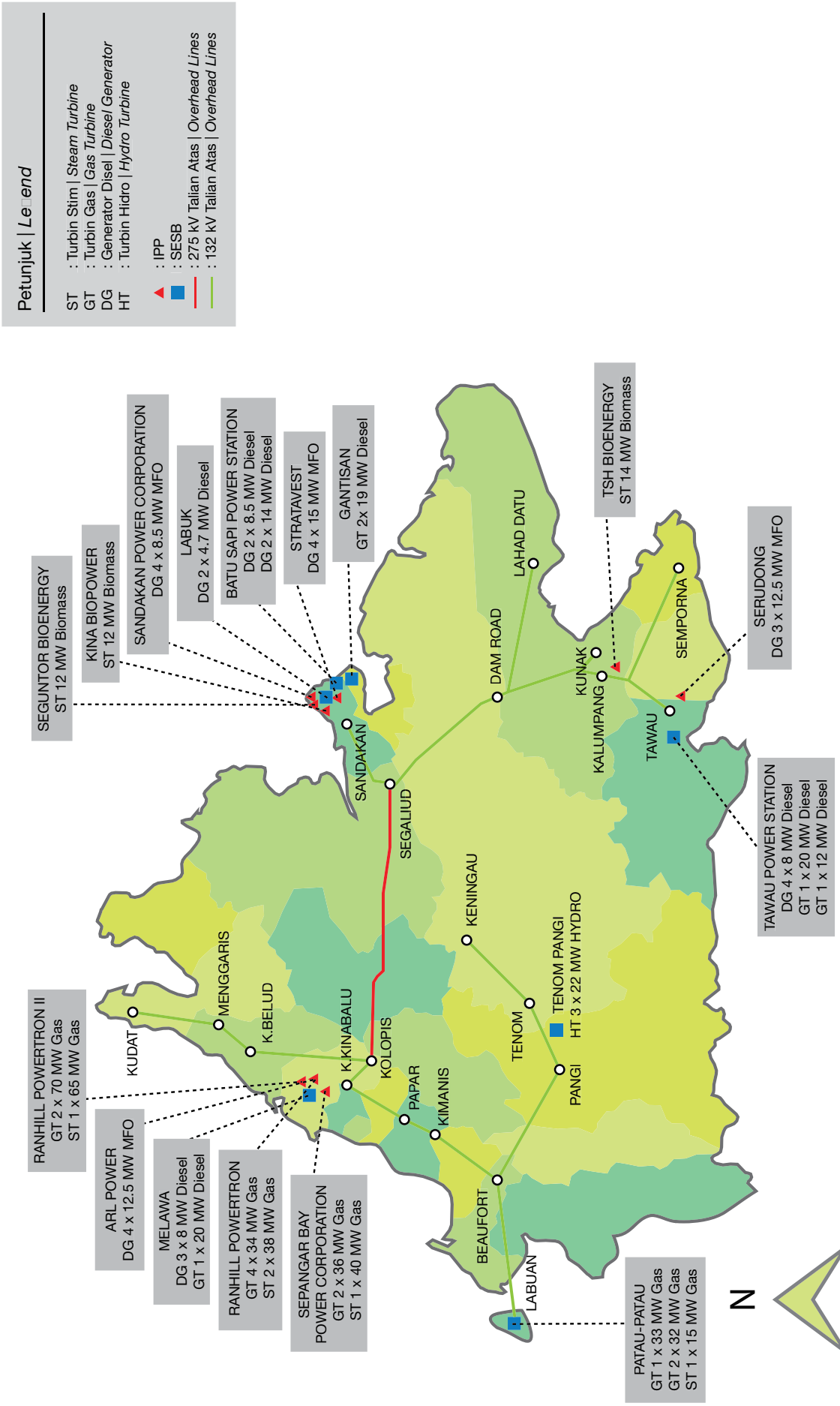
- 115** Lokasi Stesen Jana Kuasa Utama dan Sistem Grid di Semenanjung Malaysia  
*Major Power Stations and Grid System in Peninsular Malaysia*
- 116** Lokasi Stesen Jana Kuasa Utama dan Sistem Grid di Sabah  
*Major Power Stations and Grid System in Sabah*
- 117** Lokasi Stesen Jana Kuasa Utama dan Sistem Grid di Sarawak  
*Major Power Stations and Grid System in Sarawak*

# Lokasi Stesen Jana Kuasa Utama dan Sistem Grid di Semenanjung Malaysia

## Major Power Stations and Grid System in Peninsular Malaysia



## Lokasi Stesen Jana Kuasa Utama dan Sistem Grid di Sabah Major Power Stations and Grid System in Sabah



Nota | Note:

Kapasiti penjanaan tidak termasuk jumlah keseluruhan bagi jenis penjanaan berikut | Installed capacity excluding:

- Stesen kecil | small station = 17.4 MW
- Mini hidro | mini hydro = 7.0 MW
- Stesen luar bandar | rural station = 2.7 MW
- Tenaga boleh baharu | Renewable ener: y = 6.5 MW

Henti tugas Sandakan Power Corporation (SPC) pada bulan Mei 2012 | Ceased Operation of SPC in May 2012

## Lokasi Stesen Jana Kuasa Utama dan Sistem Grid di Sarawak

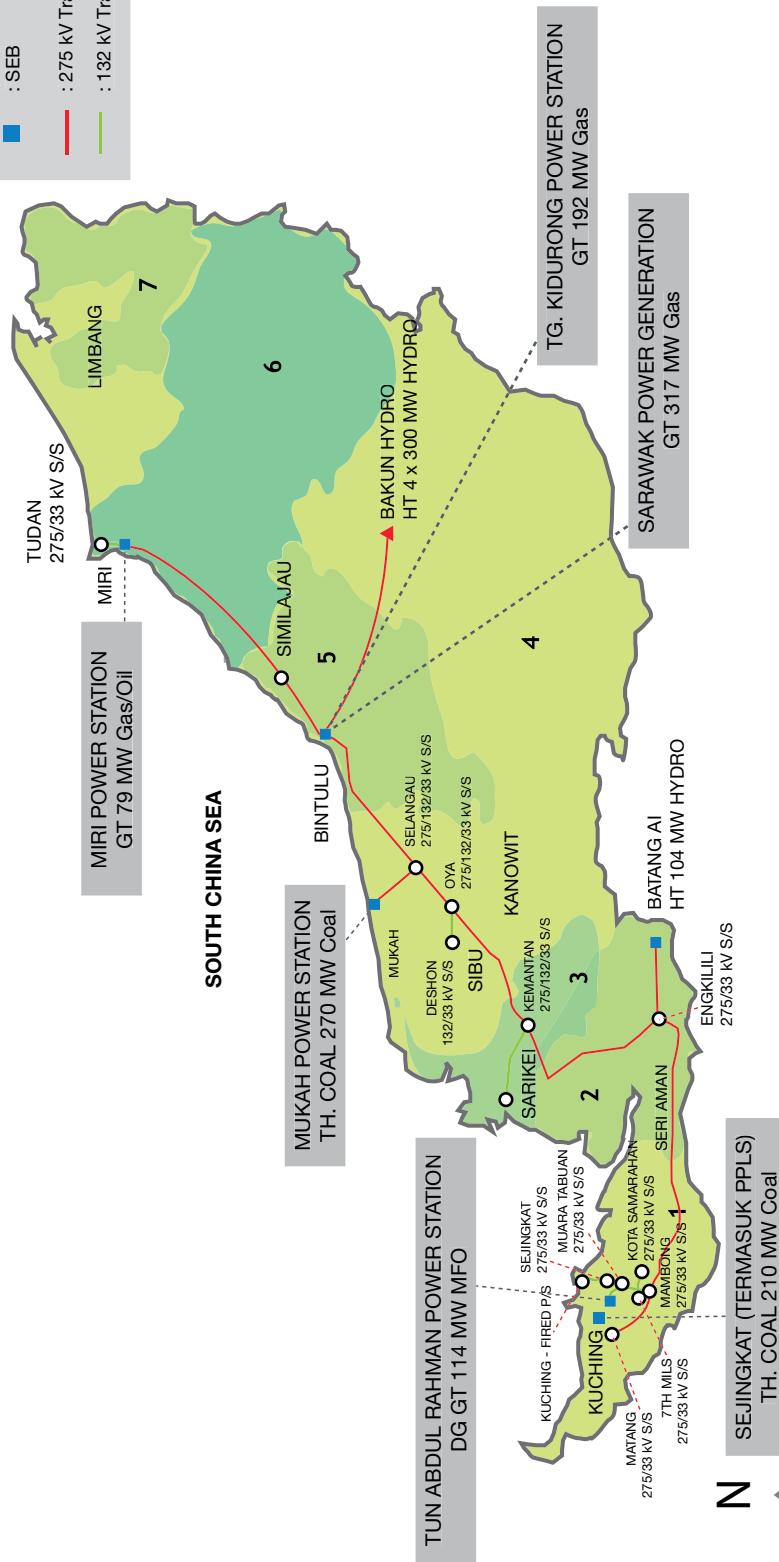
### Major Power Stations and Grid System in Sarawak

**Petunjuk | Legend**

TH. Coal : Convensional Arang Batu | Coal  
 HT : Turbin hidro | Hydro Turbine  
 GT : Turbin Gas | Gas Turbine  
 DG : Generator Diesel | Diesel Generator

▲ : IPP  
 ■ : SEB

— : 275 kV Transmission Grid System  
 — : 132 kV Transmission Grid System



- Nota | Note:**
1. Wilayah Barat | Western Region
  2. Wilayah Sri Aman | Sri Aman Region
  3. Wilayah Sarikoi | Sarikoi Region
  4. Wilayah Tengah | Central Region
  5. Wilayah Bintulu | Bintulu Region
  6. Wilayah Utara | Northern Region
  7. Wilayah Limbang | Limbang Region





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**Suruhanjaya Tenaga (Energy Commission)**

No.12, Jalan Tun Hussein  
Precinct 2, 62100, Putrajaya

Toll Free Number : 1-800-2222-78 (ST)

T: 03 8870 8500

F: 03 8888 8637