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ELECTRICITY SUPPLY INDUSTRY IN MALAYSIA

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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 dalam negeri tersebut dikemukakan oleh Sarawak Energy Berhad (SEB) mengikut permintaan Suruhanjaya Tenaga (ST).

ST dengan niat yang baik menerbitkan laporan 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 represent 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 the request by the Energy Commission (EC).

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Sistem Penjanaan

Pada tahun 2011, keseluruhan loji-loji jana kuasa di Semenanjung Malaysia menunjukkan peningkatan kecekapan thermal. Peningkatan ini disumbangkan oleh loji jana kuasa arang batu yang mencatatkan kecekapan thermal yang tinggi kerana beroperasi pada tahap maksimum berikutan kekangan bekalan gas. Secara prinsipnya, apabila sesebuah loji jana kuasa beroperasi pada tahap maksimum, kecekapan thermalnya akan turut meningkat. Disebabkan kekangan gas tersebut, kecekapan thermal secara keseluruhan di loji jana kuasa konvensional thermal berasaskan gas/minyak telah berkurang.

Faktor lain yang menjadi penanda aras prestasi pembekalan elektrik ialah Faktor Kesediaan Setara (EAF). Pada tahun 2011, stesen jana kuasa kitar terbuka dan hidro merekodkan pencapaian EAF yang tinggi melebihi 90%. Bagi loji kitar padu pula, EAF adalah rendah berikutan kekerapan proses tukar ganti daripada gas kepada *distillate*, kegagalan sistem tukar ganti serta perlaksanaan aktiviti penyenggaraan yang kerap.

Keseluruhannya, terdapat peningkatan Faktor Henti Tugas Tidak Berjadual Setara (EUOF) bagi stesen jana kuasa berasaskan arang batu dan konvensional. Ini disebabkan operasi lebih masa loji-loji tersebut berikutan kekurangan bekalan gas yang mengakibatkan berlakunya kegagalan teknikal seperti kebocoran tiub dandang dan getaran tinggi turbin. Kerja-kerja penyenggaraan ini memakan masa yang lama dan seterusnya meningkatkan peratusan EUOF.

Sistem Penghantaran

Pada tahun 2011, terdapat 5 kejadian pelantikan sistem dengan kehilangan beban 50 MW dan ke atas di mana 4 daripadanya merupakan insiden tanpa lucutan beban. Walau bagaimanapun, jumlah tenaga tidak dibekalkan semasa pelantikan telah berkurangan kepada 225.2 MWj berbanding 310.7 MWj pada tahun 2010. *Delivery Point Unreliability Index* (*DePUI*) bagi TNB yang diukur dalam minit pula mencatatkan peningkatan bacaan kepada 1.01 minit berbanding 0.85 minit pada tahun 2010.

Sistem Pengagihan

System Average Interruption Duration Index (*SAIDI*) bagi TNB yang diukur menggunakan Enhanced TOMS mencatatkan pengurangan sebanyak 28.2% daripada 96.25 pada tahun 2010 kepada 69.11 pada tahun 2011. Ke arah pengurangan SAIDI ini, TNB telah melaksanakan beberapa pelan tindak di setiap negeri di Semenanjung Malaysia dengan memberikan fokus terhadap pengurangan gangguan pada sistem voltan sederhana yang menyumbang lebih daripada 90% indeks SAIDI TNB. Selain itu, tumpuan juga diberikan terhadap kabel bawah tanah di mana lebih daripada 70% punca gangguan bekalan voltan sederhana ini adalah berpunca dari sistem kabel bawah tanah (*joint*, kabel, *third party* dan *termination*).

Performance of Electricity Supply System in Peninsular Malaysia

Generation System

In 2011, overall, power plants in Peninsular Malaysia showed an increase in thermal efficiency. This was contributed by coal power plants which recorded high thermal efficiencies as they were operated at full loads due to constraints in gas supply. In principle, high thermal efficiency can be achieved if a power plant operates at full load. The shortage in gas supply also led to decreasing overall thermal efficiency in conventional power plants based on gas/oil.

Another factor that acts as a benchmark for performance in power supply is the Equivalent Availability Factor (EAF). In 2011, open cycle and hydro power plants recorded a higher EAF of more than 90%. For combined-cycle power plants, EAF was low, contributed by frequent changeover from gas to distillate, apart from other factors including the failures of changeover system and frequent maintenance activities.

Overall, Equivalent Unplanned Outage Factor (EUOF) for coal and conventional power plants has increased. Power plants that operated exceeding the normal hours due to shortage in gas supply experienced frequent breakdown because of boiler tube leaks and turbine high vibration. The repair works were time consuming, which resulted in increase in EUOF.

Transmission System

Year 2011 recorded 5 tripping incidents with load loss of 50 MW and above including 4 incidents without load shedding. However, the amount of unsupplied energy during tripping had reduced to 225.2 MWh compared to 310.7 MWh in 2010. Delivery Point Unreliability Index (DePUI) for TNB which is measured in minutes also showed an increase to 1.01 minutes compared to only 0.85 minutes in 2010.

Distribution System

System Average Interruption Duration Index (SAIDI) for TNB which is measured by Enhanced TOMS had recorded a reduction by 28.2% from 96.25 in 2010 to 69.11 in 2011. Towards reducing SAIDI, TNB had put up several action plans in each state of Peninsular Malaysia. The main focus of the action plans was to reduce medium voltage supply interruptions which contributed about 90% out of the total SAIDI for TNB. On the other hand, focus were also given to underground cables (joints, cables, third parties and terminations) that is the main source of medium voltage interruptions.

Kualiti Kuasa

Merujuk kepada IEEE 1159, kualiti kuasa diukur berdasarkan insiden junaman voltan yang berlaku dalam jangka masa 10 milisaat sehingga 60 saat. Junaman voltan juga dikenali sebagai *undervoltage* dan diukur menggunakan *System Average RMS Index* (*SARFI*). Secara keseluruhan, hanya 40 kes junaman voltan dicatatkan pada tahun 2011 berbanding 97 kes junaman voltan pada tahun 2010. Pencapaian ini menunjukkan keberkesanan usaha pemantauan yang dilakukan secara intensif oleh TNB di kawasan-kawasan perindustrian yang terlibat.

Kualiti kuasa juga meningkat di KHTP, di mana jumlah kes junaman voltan berkurangan daripada 20 kes (melibatkan 27 pengguna) pada tahun 2010 kepada 17 kes (melibatkan 9 pengguna) pada tahun 2011.

Di Kulim Hi-Tech Park (KHTP), jumlah SAIDI telah berkurang sebanyak 10.9% dari 8.84 minit/pelanggan/tahun pada tahun 2010 kepada 7.88 minit/pelanggan/tahun pada tahun 2011. Manakala, SAIDI bagi industri pula telah meningkat kepada 0.852 minit/pelanggan/tahun pada tahun 2011 berpunca daripada kejadian pelantikan *busbar* utama akibat kebakaran alatubah pembumian pencawang 132 kV milik TNB di Bukit Tengah.

Power Quality

With reference to IEEE 1159, power quality is measured based on the number of voltage dips that occur within 10 milliseconds to 60 second. Voltage dip is also known as under voltage and measured by System Average RMS (SARFI). Overall, only 40 cases of voltage dips were recorded in 2011 compared to 97 cases of voltage dips in 2010. This improvement signifies the effectiveness of intensive monitoring by TNB in those industrial areas.

Quality of power also improved in KHTP from 20 cases of voltage dips (with 27 consumers involved) in 2010 to only 10 cases of voltage dips (with 9 consumers involved) in 2011.

In Kulim Hi-Tech Park (KHTP), the total SAIDI had reduced by 10.9% from 8.84 minutes/customer/year in 2010 to 7.88 minutes/customer/year in 2011. However, SAIDI for industry had increased to 0.852 minutes/customer/year in 2011 caused by the tripping incident of a main busbar due to fire incident at 132 kV substation earthing transformer owned by TNB at Bukit Tengah.

Prestasi Sistem Pembekalan Elektrik di Sabah

Performance of Electricity Supply System in Sabah

Sistem Penjanaan

Di Sabah, kecekapan thermal loji-loji jana kuasa IPP adalah lebih tinggi jika dibandingkan dengan loji-loji jana kuasa SESB. Ini adalah kerana kebanyakan loji-loji jana kuasa IPP masih baru dan efisien seperti loji jana kuasa kitar padu Ranhill Powertron II berbanding dengan kebanyakan loji jana kuasa kepunyaan SESB yang telah berusia dan beroperasi melebihi 20 tahun.

Secara keseluruhannya, EAF bagi loji SESB adalah lebih rendah jika dibandingkan dengan EAF bagi loji jana kuasa IPP. Bagi loji-loji IPP, EAF bagi loji kitar padu adalah lebih tinggi melebihi 90% berbanding dengan loji disel pada 76%. Ini disebabkan oleh kebanyakan loji disel seperti ARL dan Stratavest yang telah berusia dan menghadapi masalah teknikal seperti kegagalan *crankshaft* serta kesukaran mendapatkan alat geganti. Bagi SESB pula, bacaan EAF yang direkodkan adalah rendah dengan loji kitar padu pada 37% dan loji disel pada 62%. Perkara ini disumbang oleh faktor usia dan kekerapan proses senggaraan. Namun begitu, stesen jana kuasa hidro mencapai EAF setinggi 96% berikutan aliran air yang konsisten beserta dengan keadaan stesen yang baik.

Bagi EUOF pula, sasaran yang ditetapkan adalah 4% untuk loji kitar padu dan kitar terbuka serta 6% bagi loji yang menggunakan minyak/gas. Secara keseluruhan, nilai EUOF bagi loji jana kuasa IPP adalah lebih rendah berbanding loji jana kuasa SESB. Loji jana kuasa hidro SESB pula menunjukkan bacaan EUOF sebanyak 1%.

Generation System

In Sabah, the thermal efficiencies for IPP power plants were higher compared to SESB power plants. This was due to the fact that most of IPPs in Sabah were still new and efficient such as Ranhill Powertron II combined cycle power plant compared to most of SESB owned power plants which have aged and have operated for more than 20 years.

In general, the EAF of power plants operated by SESB were lower compared to power plants operated by IPPs. EAF for IPP combined cycle power plants were at more than 90% compared to diesel power plants at 76%. This was because the majority of diesel power plants such as ARL and Stratavest had aged, causing technical problems to arise such as failure of crankshaft and difficulties to obtain relay devices. For SESB, lower EAF were recorded with combined cycle power plants at 37% and diesel at 62%. This was attributed to the age factor and frequent maintenance activities. Meanwhile, hydro power plants reached higher EAF at 96% due to consistent water flow and good technical condition.

The target for EUOF was 4% for combined and open cycle power plants and 6% for conventional oil/gas power plants. In total, EUOF for power plants operated by IPPs was lower compared to EUOF for power plants operated by SESB, except for hydro which recorded 1% of EUOF.

Sistem Penghantaran

Pada tahun 2011, sistem minit bagi sistem grid di Sabah menunjukkan peningkatan ketara sebanyak 98.6% daripada 20.21 minit pada tahun 2010 kepada 40.13 minit pada tahun 2011. Terdapat 2 insiden pelantikan yang menyebabkan kehilangan beban 50 MW dan ke atas. Kejadian ini melibatkan kehilangan beban sebanyak 88.53 MW dan 65.15 MW dengan jumlah tenaga yang tidak dibekalkan sebanyak 4,146.7 MWj.

Sistem Pengagihan

SAIDI keseluruhan negeri Sabah telah berkurangan sebanyak 27.9% daripada 687 minit/pelanggan/tahun pada tahun 2010 kepada 495 minit/pelanggan/tahun pada tahun 2011. Bagi tujuan pengukuran SAIDI, Sabah telah dibahagikan kepada 3 sektor iaitu sektor 1, 2 dan 3. Setiap sektor diberi sasaran masing-masing dengan sektor 1: 400 minit, sektor 2 dan 3: 700 minit. Antara sektor-sektor tersebut, sektor 1 dan 2 telah berjaya mencapai sasaran SAIDI yang diberikan, masing-masing pada 307.6 minit dan 632.28 minit. Pencapaian ini menunjukkan prestasi sistem pengagihan telah bertambah baik di Sabah.

Transmission System

In 2011, system minutes for grid system in Sabah showed a significant increase by 98.6% from 20.21 minutes in 2010 to 40.13 minutes in 2011. There were 2 cases of tripping incident with load loss of 50 MW and above. These incidents caused load loss of 88.53 MW and 65.15 MW with a total of 4,146.7 MWh of unsupplied energy.

Distribution System

The overall SAIDI in Sabah reduced by 27.9% from 687 minutes/customer/year in 2010 to 495 minutes/customer/year in 2011. For the purpose of measuring SAIDI, Sabah was divided into 3 sectors, namely sector 1, sector 2 and sector 3. Each sector were given targets for SAIDI with sector 1: 400 minutes, sector 2 and sector 3: 700 minutes. Among them, sector 1 and sector 2 achieved the target with 307.6 minutes and 632.28 minutes of SAIDI respectively. The achievement signified an improvement of the distribution system in Sabah.

Kos Tenaga

Aliran Harga Bahan Api Dunia

Sepanjang tahun 2011, harga pasaran minyak mentah berdasarkan Brent Spot berada antara USD 109 dan USD 123 setong. Harga tersebut adalah lebih tinggi jika dibandingkan pada tahun sebelumnya iaitu antara USD 75 dan USD 85 setong.

Bagi arang batu pula, harga berdasarkan *Freight on Board* (*FOB*) Newcastle dan *FOB* Richards Bay meningkat kepada sekitar USD 110 sehingga USD 120 setan pada tahun 2011. Kenaikan harga bahan api ini secara langsungnya mempengaruhi proses penetapan tarif elektrik di Malaysia.

Harga Gas bagi Sektor Penjanaan Tenaga di Malaysia

Bagi menyokong pertumbuhan ekonomi dan mengurangkan beban peningkatan tarif elektrik yang ditanggung oleh pengguna, pihak kerajaan telah menetapkan diskaun sebanyak 75 peratus daripada harga gas (formula) kepada sektor penjanaan tenaga elektrik. Langkah ini diambil bagi membantu mengekalkan purata harga elektrik pada paras 33.54 sen/kWj selepas pelarasan tarif elektrik dibuat pada Jun 2011.

Energy Cost

World Fuel Price Trends

Throughout 2011, the market price for crude oil based on Brent Spot Price of crude oil stood at between USD 109 and USD 123 per barrel in 2011, higher compared to USD 75 and USD 85 per barrel in the previous year.

For coal, the price, which is based on Freight on Board (FOB) Newcastle and FOB Richards Bay, increased to be within USD 110 and USD 120 per tonne in 2011. The hike in world's fuel price had given direct influences in electricity tariffs setting process in Malaysia.

Gas Price of Power Generation Sector in Malaysia

In order to sustain economic growth and to reduce the burden of higher electricity price faced by end consumers, the Government decided to subsidize about 75% of the gas price (formula) to the power sector for electricity generation purposes. This step was taken to maintain the average tariffs at 33.54 sen/kWh after the adjustment of electricity tariff in Jun 2011.

Semakan Tarif Elektrik

Semenanjung Malaysia

Pada tahun 2011, semakan tarif elektrik TNB telah dilaksanakan dan ia merupakan pelarasan kali kedua yang melibatkan kadar tarif asas TNB sejak Jun 2006. Mulai 1 Jun 2011, kadar purata tarif elektrik TNB dinaikkan sebanyak 2.23 sen/kWj daripada 31.31 sen/kWj kepada 33.54 sen/kWj. Kenaikan ini adalah bagi menampung kesan penyelarasan harga gas kepada sektor elektrik daripada RM 10.70/mmBtu kepada RM 13.70/mmBtu (bersamaan dengan RM 1.60/kWj).

Electricity Tariff Revision

Peninsular Malaysia

In 2011, electricity tariff for TNB was revised and it was a second adjustment made based on TNB tariff structure since June 2006. Starting from the 1st June 2011, the average TNB electricity tariff increased by 2.23 sen/kWh from 31.31 sen/kWh to 33.54 sen/kWh. The new electricity tariff rate was required to accommodate an increase of gas price to the power sector from RM 10.70/mmBtu to RM 13.70/mmBtu (equivalent to 1.60 sen/kWh).

Dalam semakan semula tarif elektrik tersebut, kategori jaluran pengguna asas dikekalkan pada 200 kWj sebulan pada kadar sedia ada iaitu 21.8 sen/kWj. Kadar tarif bagi penggunaan 100 kWj yang berikutnya turut dikekalkan pada kadar 33.40 sen/kWj. Pada masa yang sama, pengguna akan dikenakan dengan caj tambahan sebanyak 1% daripada bil bulanan untuk disumbangkan kepada dana tenaga boleh baharu (RE) untuk menampung kos Feed-in-Tariff (FiT). Bagaimanapun kutipan tambahan ini tidak dikenakan kepada pengguna elektrik yang menggunakan elektrik sebanyak 300 kWj dan ke bawah sebulan. Kutipan 1% FiT untuk dana RE telah berkuatkuasa mulai 1 Disember 2011.

Sabah dan Wilayah Persekutuan Labuan

Kali terakhir semakan tarif elektrik bagi Sabah dan Wilayah Persekutuan Labuan adalah pada April 1986. Sehingga tahun kewangan 2010, dengan subsidi bahan api, kos pembekalan elektrik adalah 31.7 sen/kWj berbanding kadar tarif elektrik yang ditetapkan iaitu 25.5 sen/kWj. Berikutan dengan kos pembekalan elektrik yang semakin meningkat, pihak kerajaan telah meluluskan permohonan SESB bagi menyemak semula tarif elektrik ini. Kadar tarif baru telah diumumkan mulai 15 Julai 2011, dengan kenaikan purata tarif elektrik sebanyak 15% daripada 25.50 sen/kWj kepada 29.25 sen/kWj.

Pembekalan dan Permintaan Elektrik di Semenanjung Malaysia

Kehendak maksimum sistem grid di Semenanjung Malaysia telah meningkat sebanyak 2.7% daripada 15,072 MW pada tahun 2010 kepada 15,476 MW pada tahun 2011. Namun begitu, tiada penambahan kapasiti baru yang dilaporkan di mana ia kekal pada paras 21,817 MW seperti dua tahun yang sebelumnya. Pada tahun 2011, kapasiti penjanaan terpasang TNB adalah sebanyak 7,054 MW dan selebihnya dibekalkan oleh penjana-penjana bebas (IPP). Margin rizab sistem pula berada dalam lingkungan 41% berbanding 45% pada tahun sebelumnya.

Dari segi penjanaan campuran, Malaysia masih lagi bergantung kepada gas asli dan arang batu sebagai sumber bahan api utama penjanaan. Namun begitu, campuran penjanaan berasaskan gas asli telah berkurang berbanding tahun-tahun sebelumnya. Campuran penjanaan berasaskan arang batu pula telah meningkat berikutan kekurangan bekalan gas kepada sektor penjanaan. Permintaan tenaga harian tertinggi adalah pada 318.4 GWj pada tahun 2011 berbanding 311.5 GWj pada tahun 2010. Di samping itu, jualan tenaga elektrik yang dilaporkan oleh TNB mengikut tahun kalendar juga meningkat kepada 93,640 GWj pada tahun 2011 berbanding 90,770 GWj pada tahun 2010.

While revising electricity tariff, the lifeline consumers category was maintained at 200 kWh per month at the existing rate of 21.8 sen/kWh. Meanwhile, electricity tariff rate for consumption of the next 100 kWh was also maintained at 33.40 sen/kWh. At the same time, the consumers were charged an additional 1% of the total monthly bill for contribution to the renewable energy (RE) fund to cover the cost of the Feed-in-Tariff (FiT). However, the charge did not apply to consumers using 300 kWh of electricity and below. The collection of 1% for FIT was effective from 1st December 2011.

Sabah and Federal Territory of Labuan

The last tariff revision for Sabah and Federal Territory of Labuan was done in April 1986. As at financial year 2010, with subsidy given for fuel, the actual cost of electricity supply was 31.7 sen/kWh compared to the tariff set for consumers at 25.5 sen/kWh. Subsequent to the increasing electricity supply cost, the government had approved SESB's proposal to review its electricity tariff. The new rate was announced on 15 July 2011, with an average increase in electricity tariff by 15% from 25.50 sen/kWh to 29.25 sen/kWh.

Electricity Supply and Demand in Peninsular Malaysia

The maximum demand of the grid system in Peninsular Malaysia had increased by 2.7% from 15,072 MW in 2010 to 15,476 MW in 2011. However, no new capacity was added to the existing generation capacity. Therefore, it remained at 21,817 MW as in the previous two years. Out of the total generation capacity, 7,054 MW came from TNB and the remaining capacities were from IPPs. Meanwhile, the reserve margin of the system had decreased from 45% in 2010 to 41% in 2011.

In terms of the generation mix, Malaysia is highly dependent on natural gas and coal as the primary fuel source for generation. However, the share of gas out of the total generation mix had reduced compared to the previous years. In the meantime, the share of coal in generation mix increased due to the shortage in gas supplied to the generation sector. The highest daily energy demand was at 318.4 GWh in 2011 compared to 311.5 GWh in 2010. In addition, the sales of electricity reported by TNB based on calendar year had also increased to 93,640 GWh in 2011 compared to 90,770 GWh in 2010.

Pembekalan dan Permintaan Elektrik di Sabah

Pada ketika ini, Sabah masih lagi berhadapan dengan isu kekurangan bekalan tenaga elektrik berikutan dengan tahap kesediaan dan daya harap yang rendah bagi sesetengah stesen jana kuasa, terutamanya stesen jana kuasa berasaskan disel. Pada tahun 2011, kenaikan sebanyak 6.5% direkodkan bagi kehendak maksimum di Sabah iaitu 830.1 MW pada 2011 berbanding 779.7 MW pada tahun 2010.

Pengoperasian unit GT1C (60 MW) pada 22 April 2011 telah melengkapkan kapasiti terpasang Ranhill Powertron II bagi memenuhi permintaan elektrik yang semakin meningkat. Dengan penambahan tersebut, kapasiti terpasang di Sabah telah meningkat kepada 1,276 MW manakala kapasiti boleh harapnya pula sebanyak 1,168 MW pada tahun 2011. Daripada jumlah keseluruhan kapasiti boleh harap ini, 435.2 MW merupakan kapasiti terpasang SESB manakala selebihnya ditampung oleh IPP Sabah.

Dari segi penjanaan campuran, gas merupakan penyumbang terbesar sebanyak 57.3%, diikuti dengan disel sebanyak 17.7% dan hidro sebanyak 12.5%. Permintaan tenaga elektrik harian tertinggi dicatatkan sebanyak 15.7 GWj berbanding 14.8 GWh pada tahun 2010. Di samping itu, jualan tenaga elektrik SESB meningkat naik kepada 4,275 GWj pada tahun 2011 berbanding 4,127 GWj pada tahun 2010.

Pembekalan dan Permintaan Elektrik di Sarawak

Sarawak Energy Berhad (SEB) yang dimiliki sepenuhnya oleh Kerajaan Negeri Sarawak, beroperasi secara bersepadu dengan penglibatan dalam sektor penjanaan, penghantaran dan pengagihan elektrik di Sarawak. SEB melalui Syarikat SESCO Berhad bertanggungjawab ke atas infrastruktur penghantaran dan pengagihan serta mempunyai kapasiti penjanaan sebanyak 542 MW, manakala baki kapasiti penjanaan lain dibekalkan oleh anak-anak syarikat SEB seperti Sejingkat Power Corporation Sdn Bhd (SPC), PPLS Power Generation Sdn Bhd (PPLS), Sarawak Power Generation Sdn Bhd (SPG) dan Mukah Power Generation Sdn Bhd (MPG) dengan kapasiti terkumpul sebanyak 816 MW.

Di Sarawak, permintaan maksimum telah meningkat daripada 1,091 MW pada tahun 2010 kepada 1,278 MW pada tahun 2011. Di samping itu, terdapat pertambahan seramai 23,346 pelanggan baru menjadikan jumlah keseluruhan pelanggan SEB meningkat kepada 528,551 pada tahun 2011. Jualan tenaga elektrik pula telah meningkat sebanyak 13.2% kepada 6,486 GWj dengan nilai sebanyak RM 1,673 juta.

Electricity Supply and Demand in Sabah

Currently, Sabah is still facing an issue of insufficient supply of electricity due to the low availability and reliability of certain power generators, especially the diesel-based generators. In 2011, the maximum demand in Sabah recorded an increase of 6.5% from 779.7 MW in 2010 to 830.1 MW in 2011.

The commissioning of ST1C (60 MW) on the 22nd of April 2011 meant that Ranhill Powertron II started to operate at its full capacity to fulfill an increasing demand of electricity. With the additional capacity, the total installed capacity in Sabah increased to 1,276 MW while its dependable capacity increased to 1,168 MW in 2011. Out of the total dependable capacity, 435.2 MW were SESB's installed capacity while the remaining were installed capacity of IPPs in Sabah.

In terms of generation mix, gas had the highest share of 57.3%, followed by diesel at 17.7% and hydro at 12.5%. The highest daily electricity demand in Sabah was at 15.7 GWh in 2011 compared to 14.8 GWh in 2010. Meanwhile, the total electricity sales increased to 4,275 GWh in 2011 compared to 4,127 GWh in 2010.

Electricity Supply and Demand in Sarawak

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 controls the State's transmission and distribution infrastructure, with 542 MW of generating capacity and the balance of its generating capacity was supplied by other subsidiaries namely Sejingkat Power Corporation Sdn Bhd (SPC), PPLS Power Generation Sdn Bhd (PPLS), Sarawak Power Generation Sdn Bhd (SPG) and Mukah Power Generation Sdn Bhd (MPG) with a combined generating capacity of 816 MW.

In Sarawak, the maximum demand increased from 1,091 MW in 2010 to 1,278 MW in 2011. 23,346 new customers have been connected in 2011, bringing up the total number of customers to 528,551. The total sales grew by 13.2% to 6,486 GWh with a total value of RM 1,673 million.

PROFIL NEGARA
COUNTRY PROFILE

Keluasan Kawasan I *Area*	330,803 km^2
Iklim I *Climate*	Jenis tropika I *Tropical type* Purata suhu di antara 21° C hingga 32° C *Average temperature is between 21° C to 32° C* Purata taburan hujan tahunan 3,540 mm *Average annual rainfall is 3,540 mm*
Populasi I *Population*	29.0 juta I *million*
Tenaga Kerja I *Labour Force*	12.6 juta I *million*
Petunjuk Ekonomi Utama I *Key Economic Indicator*	
KDNK pada Harga Semasa I *GDP at Current Prices*	RM 881.1 bilion I *billion*
KDNK pada Harga Malar 2005 I *GDP at Constant 2005 Prices*	RM 709.3 bilion I *billion*
KDNK pada Harga Semasa per Kapita *GDP at Current Prices per Capita*	RM 30,382 per Kapita I *per Capita*
KDNK pada Harga Malar 2005 per Kapita *GDP at Constant 2005 Prices per Capita*	RM 24,457 per Kapita I *per Capita*
PNK pada Harga Semasa I *GNI at Current Prices*	RM 859.1 bilion I *billion*
PNK pada Harga Malar 2005 I *GNI at Constant 2005 Prices*	RM 664.6 bilion I *billion*
PNK pada Harga Semasa per Kapita *GNI at Current Prices per Capita*	RM 29,661 per Kapita I *per Capita*
PNK pada Harga Malar 2005 per Kapita *GNI at Constant 2005 Prices per Capita*	RM 23,174 per Kapita I *per Capita*
Imbangan Akaun Semasa I *Current Account Balance*	RM 97.1 bilion I *billion*
Simpanan Luar Negara Kasar I *Net International Reserves*	RM 423.3 bilion I *billion*
Tabungan Negara Kasar I *Gross National Saving*	35.5% (daripada PNK/*of GNI*)
Purata Harga Jualan Elektrik I *Electricity Average Selling Price*	
Semenanjung Malaysia I *Peninsular Malaysia*	31.72 sen/kWj I *sen/kWh*
Sabah	26.20 sen/kWj I *sen/kWh*
Sarawak	29.41 sen/kWj I *sen/kWh*
Petunjuk Tenaga Elektrik Utama I *Key Electricity Indicator*	
Jumlah Penjanaan Tenaga Elektrik I *Total Electricity Generation*	127,069 GWj I *GWh*
Jumlah Penggunaan Tenaga Elektrik *Total Electricity Consumption*	107,330 GWj I *GWh*
Penggunaan Tenaga Elektrik per Kapita *Electricity Consumption per Capita*	3,701 kWj per Kapita I *kWh per Capita*
Intensiti Tenaga Elektrik *Electricity Intensity*	151.3 kWj per unit KDNK (RM ribu) *GDP (RM thousand)*

Sumber I *Source*:
Bank Negara Malaysia, Jabatan Perangkaan Negara, Tenaga Nasional Berhad, Sabah Electricity Sdn Bhd, Sarawak Energy Berhad, Laporan Imbangan Tenaga Negara 2011 | *Central Bank of Malaysia, Department of Statistics, Tenaga Nasional Berhad, Sabah Electricity Sdn Bhd, Sarawak Energy Berhad, National Energy Balance Report 2011*

PETA MALAYSIA
MAP OF MALAYSIA

SOROTAN PRESTASI

PERFORMANCE HIGHLIGHTS

SOROTAN PRESTASI
PERFORMANCE HIGHLIGHTS

1. Prestasi Pembekalan dan Perkhidmatan Elektrik di Semenanjung Malaysia
Performance of Electricity Supply and Services in Peninsular Malaysia

1.1 Sistem Penjanaan TNB dan Penjana Kuasa Bebas (IPP) di Semenanjung Malaysia
Generation System of TNB and IPPs in Peninsular Malaysia

Jadual A.1: Purata Kecekapan Thermal (%)
Table A.1: Average Thermal Efficiency (%)

Jenis Loji I *Plant Type*	2007		2008		2009		2010		2011	
	TNB	IPP	TNB	IPP	TNB	IPP	TNB	IPP	TNB	IPP
Kitar Padu I *Combined Cycle*	41.50	45.20	41.20	44.80	41.00	44.30	41.20	41.90	40.84	43.98
Kitar Terbuka I *Open Cycle*	25.90	27.60	25.60	26.10	17.40	27.40	22.60	27.30	22.30	27.09
Konvensional (Minyak/Gas) *Conventional (Oil/Gas)*	27.80	32.40	18.30	32.20	n/a	31.90	25.60	32.30	27.27	30.58
Konvensional (Arang Batu) *Conventional (Coal)*	-	33.90	-	33.80	-	34.70	-	33.10	-	35.11

Jadual A.2: Purata Faktor Kesediaan Setara (EAF) (%)
Table A.2: Average Equivalent Availability Factor (EAF) (%)

Jenis Loji I *Plant Type*	2007		2008		2009		2010		2011	
	TNB	IPP	TNB	IPP	TNB	IPP	TNB	IPP	TNB	IPP
Kitar Padu I *Combined Cycle*	89.40	87.00	90.70	90.70	93.20	91.20	90.50	90.60	84.95	88.57
Kitar Terbuka I *Open Cycle*	95.90	99.20	97.00	98.10	97.30	98.40	92.60	97.90	97.56	94.53
Konvensional (Minyak/Gas) *Conventional (Oil/Gas)*	99.20	n/a	99.90	78.10	99.30	83.20	98.10	88.20	82.46	87.43
Konvensional (Arang Batu) *Conventional (Coal)*	-	88.80	-	78.50	-	78.00	-	84.30	-	80.52
Hidro I *Hydro*	82.20	-	91.30	-	95.30	-	86.00	-	92.34	-

Jadual A.3: Purata Faktor Henti Tugas Tidak Berjadual Setara (EUOF) (%)
Table A.3: Average Equivalent Unplanned Outage Factor (EUOF) (%)

Jenis Loji I *Plant Type*	2007		2008		2009		2010		2011	
	TNB	IPP	TNB	IPP	TNB	IPP	TNB	IPP	TNB	IPP
Kitar Padu I *Combined Cycle*	2.70	n/a	2.11	1.07	1.61	3.31	2.29	2.97	5.50	3.95
Kitar Terbuka I *Open Cycle*	1.00	n/a	1.73	0.71	0.93	0.61	3.99	0.89	0.98	0.71
Konvensional (Minyak/Gas) *Conventional (Oil/Gas)*	0.20	n/a	n/a	5.12	n/a	11.85	0.33	4.38	17.53	5.62
Konvensional (Arang Batu) *Conventional (Coal)*	-	3.10	-	11.17	-	12.40	-	7.77	-	10.61
Hidro I *Hydro*	n/a	-	n/a	-	1.35	-	0.37	-	0.93	-

Nota I *Note*:
n/a – Tiada maklumat I *Not available*

1.2 Sistem Penghantaran TNB
TNB Transmission System

Jadual A.4: Pelantikan Sistem Penghantaran dengan Kehilangan Beban sebanyak 50 MW dan ke Atas
Table A.4: Transmission System Trippings with Load Loss of 50 MW and Above

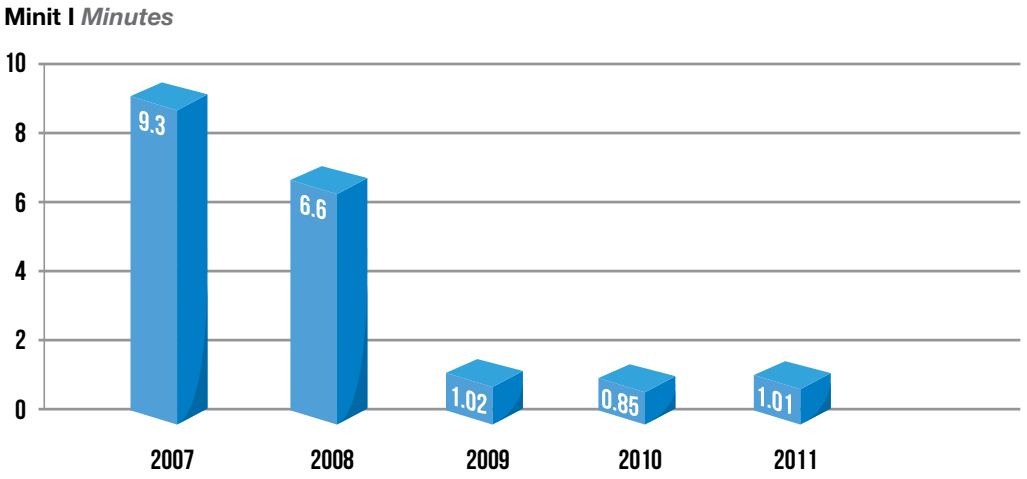
Petunjuk I *Indicator*	2007	2008	2009	2010	2011
Bilangan Pelantikan Tanpa Lucutan Beban *Number of Trippings without Load Shedding*	9	6	2	4	4
Tenaga Yang Tidak Dibekalkan Semasa Pelantikan (MWj) *Unsupplied Energy during Trippings (MWh)*	1,246.8*	309.8	158.3	310.7	225.2
Bilangan Pelantikan Dengan Lucutan Beban *Number of Trippings with Load Shedding*	1	0	0	0	1
Tenaga Tidak Dibekalkan Semasa Lucutan Beban (MWj) *Unsupplied Energy During Load Shedding (MWh)*	103.5	0	0	0	171.3

Nota I *Note*:
* Termasuk insiden pelantikan di Pulau Pinang pada 20 November 2007I *Including tripping incident in Penang on 20th of November 2007*

Jadual A.5: Pelantikan Bulanan bagi Sistem Penghantaran dengan Kehilangan Beban sebanyak 50 MW dan ke Atas
Table A.5: Monthly Trippings of Transmission System with Load Loss of 50 MW and Above

Petunjuk I *Indicator*	Jan *Jan*	Feb *Feb*	Mac *Mar*	Apr *Apr*	Mei *May*	Jun *June*		Jul *Jul*	Ogos *Aug*	Sep *Sept*	Okt *Oct*	Nov *Nov*	Dis *Dec*
Bilangan Pelantikan Tanpa Lucutan Beban *Number of Trippings Without Load Shedding*	0	0	1	0	1	2		0	0	0	0	0	0
Bilangan Pelantikan Dengan Lucutan Beban *Number of Trippings With Load Shedding*	0	0	0	1	0	0		0	0	0	0	0	0
Kehilangan Beban Maksimum (MW) *Maximum Load Losses (MW)*	-	-	62.6	350	81	58	104	-	-	-	-	-	-
Tenaga Yang Tidak Dibekalkan Semasa Pelantikan (MWj) *Unsupplied Energy During Trippings (MWh)*	-	-	41.7	-	49.3	18.4	115.8	-	-	-	-	-	-
Purata Tenaga Tidak Dibekalkan Setiap Pelantikan (MWj) I *Average Unsupplied Energy During Trippings (MWh)*	-	-	41.7	-	49.3	18.4	115.8	-	-	-	-	-	-
Purata Tempoh Setiap Pelantikan (Jam: Minit) *Average Duration Per Tripping (Hour: Minutes)*	-	-	0:40	0:29	0:37	0:19	1:07	-	-	-	-	-	-
Tenaga Tidak Dibekalkan Semasa Lucutan Beban (MWj) I *Unsupplied Energy During Load Shedding (MWh)*	-	-	-	171.25	-	-		-	-	-	-	-	-

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



Tahun Kewangan 2010/11 I *Financial Year 2010/11*

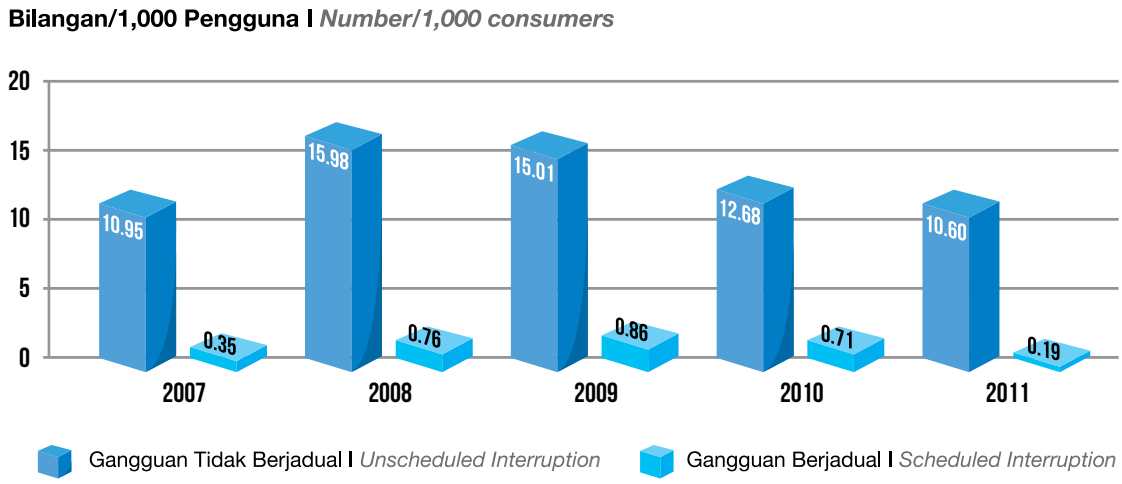
Jadual A.6: Insiden Pelantikan bagi Talian/Kabel per 100 cct-km mengikut Tahap Voltan
Table A.6: Tripping Incidents for Lines/Cables per 100 cct-km by Voltage Level

Tahap Voltan I *Voltage Level*	2007	2008	2009	2010	2011
500 kV	0.16	0.72	0.00	0.00	0.15
275 kV	0.89	1.11	0.53	0.70	0.47
132 kV	1.14	1.45	0.96	0.84	0.95

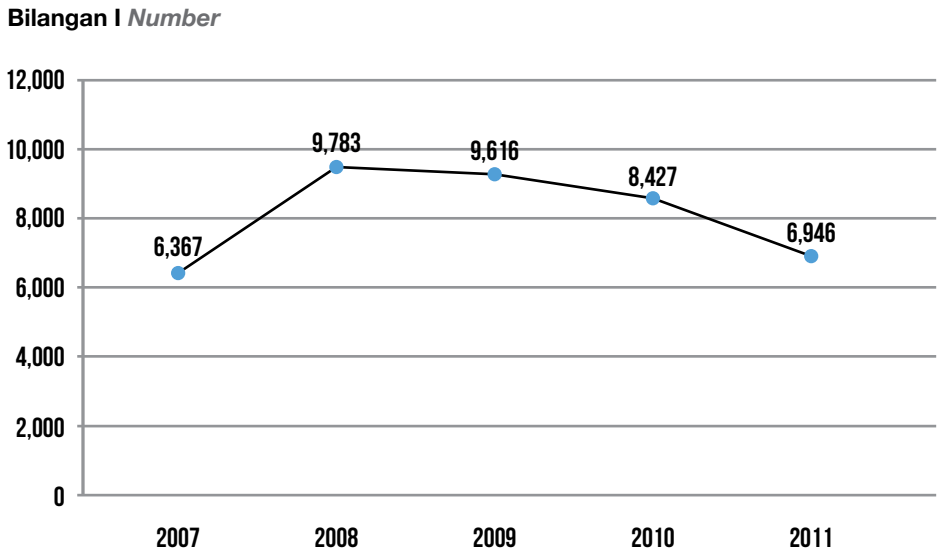
Tahun Kewangan 2010/11 I *Financial Year 2010/11*

1.3 Sistem Pengagihan TNB
TNB Distribution System

Carta A.2: Gangguan Bekalan Elektrik per 1,000 Pengguna
Chart A.2: Electricity Supply Interruptions per 1,000 Consumers



Carta A.3: Purata Gangguan Bekalan Elektrik Bulanan
Chart A.3: Monthly Average Electricity Supply Interruptions



Jadual A.7: Gangguan Bekalan Elektrik mengikut Negeri
Table A.7: Electricity Supply Interruptions by State

Negeri I *State*	2007	2008	2009	2010	2011
Perak	5,157	11,308	11,673	10,835	8,930
Kedah	3,695	9,448	9,604	7,901	7,635
Johor	8,493	19,960	18,873	16,590	12,540
Pulau Pinang	9,872	10,711	8,610	7,376	5,662
Kelantan	7,589	12,499	13,615	10,151	8,211
Selangor	16,313	16,176	16,015	14,569	11,885
Perlis	773	1,900	2,029	772	1,240
WP Kuala Lumpur	11,097	13,962	12,901	11,970	9,620
WP Putrajaya/Cyberjaya	30	28	8	13	8
Negeri Sembilan	4,406	6,148	6,397	6,461	5,248
Melaka	1,646	4,529	4,973	4,131	4,772
Pahang	5,317	5,760	6,538	5,621	4,226
Terengganu	2,018	4,965	3735	3,866	3,370
Semenanjung Malaysia I *Peninsular Malaysia*	**76,406**	**117, 394**	**115,392**	**101,126**	**83,347**

Jadual A.8: Gangguan Bekalan Elektrik mengikut Tahap Voltan
Table A.8: Electricity Supply Interruptions by Voltage Level

Tahap Voltan I *Voltage Level*	2007	2008	2009	2010	2011
Voltan Tinggi I *High Voltage* (66 kV dan ke atas I *66 kV and above*)	31	35	30	24	26
Voltan Sederhana I *Medium Voltage* (6.6 kV – 33 kV)	11,087	12,671	13,438	12,170	9,681
Voltan Rendah I *Low Voltage* (1 kV dan ke bawah I *1 kV and below*)	65,288	104,688	101,924	88,932	73,640
Jumlah I *Total*	**76,406**	**117,394**	**115,392**	**101,126**	**83,347**

Jadual A.9: Bilangan Gangguan Bekalan Elektrik
Table A.9: Number of Electricity Supply Interruptions

Bilangan I *Number*	2007	2008	2009	2010	2011
Gangguan Tidak Berjadual I *Unscheduled Interruptions**	74,058	112,064	108,708	94,940	81,860
Gangguan Berjadual I *Scheduled Interruptions*	2,348	5330	6,263	6,011	1487
Jumlah Gangguan I *Total Interruptions*	**76,406**	**117,394**	**115,392**	**101,126**	**83,347**

Nota I *Note:*
* Termasuk Gangguan Voltan Tinggi I *Including High Voltage Interruptions*

Jadual A.10: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan
Table A.10: Percentage of Unscheduled Supply Interruptions by Type of Interruptions

Punca Gangguan *Type of Interruption*	Voltan Rendah *Low Voltage*	Voltan Sederhana *Medium Voltage*	Jumlah *Total*	Peratus *Percentage* (%)
Haiwan I *Animal*	1,037	526	1,563	1.88
Kabel I *Cable*	2,146	2,100	4,246	5.10
Auto Reclose	-	7	7	0.01
Konduktor I *Conductor*	9,707	371	10,078	12.10
Feeder Pillar	2,675	-	2,675	3.21
Banjir I *Flood*	2	1	3	0.00
Fius I *Fuse*	4,070	6	4,076	4.89
Kotak Fius I *Fuse Box*	9,033	77	9,110	10.93
Insulated Piercing Connector (IPC)	25,147	-	25,147	30.18
Penebat I *Insulator*	-	16	16	0.02
Sendi I *Joint*	21	4,297	4,318	5.18
Pautan I *Link*	67	9	76	0.09
Lain-lain I *Others*	45	84	129	0.15
Pokok I *Trees*	12,302	80	12,382	14.86
Jumper	-	8	8	0.01
Null	-	2	2	0.00
Tiang I *Pole*	2,476	120	2,596	3.12
Ribut I *Storm*	373	26	399	0.48
Geganti I *Relay*	-	39	39	0.05
Peralatan Suis I *Switchgear*	-	271	271	0.33
Termination	455	135	590	0.71
Pihak Ketiga I *Third Party*	3,648	1,102	4,750	5.70
Alatubah I *Transformer*	-	182	182	0.22
Ubahtika I *Transient*	-	188	188	0.23
Vandalisma I *Vandalisme*	436	34	470	0.55
Jumlah | *Total*	**73,640**	**9,681**	**83,321**	**100**

Nota I *Note:*
Tidak termasuk Gangguan Voltan Tinggi I *Excluding High Voltage Interruptions*

1.4 *TNB: System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and Customer Average Interruption Duration Index (CAIDI)*

Jadual A.11: SAIDI (Minit/Pelanggan/Tahun) mengikut Tahap Voltan
Table A.11: SAIDI (Minutes/Customer/Year) by Voltage Level

Tahap Voltan I *Voltage Level*	2007	2008	2009	2010	2011
Voltan Tinggi I *High Voltage* (66 kV dan ke atas I *66 kV and above*)	2.92	3.21	1.05	1.17	0.94
Voltan Sederhana I *Medium Voltage* (6.6 kV – 33 kV)	62.62	68.31	56.72	88.1	63.25
Voltan Rendah I *Low Voltage* (1 kV dan ke bawah I *1 kV and below*)	10.17	15.79	8.30	6.98	4.93
Jumlah I *Total*	**75.7**	**87.3**	**66.1**	**96.25**	**69.11**

Nota I *Note:*
2007 – 2009 : pengukuran SAIDI menggunakan TOMS I *SAIDI measured using TOMS*
2010 – 2011: pengukuran SAIDI menggunakan *Enhanced TOMS* I *SAIDI measured using Enhanced TOMS*

Jadual A.12: SAIDI (Minit/Pelanggan/Tahun) mengikut Negeri
Table A.12: SAIDI (Minutes/Customer/Year) by State

Negeri | *State*	2007	2008	2009	2010	2011
Perak	49.45	61.26	67.51	194.71	119.73
Kedah	75.03	116.55	77.21	127.66	87.18
Johor	90.52	120.47	79.88	119.95	78.05
Pulau Pinang	83.39	104.43	111.28	109.62	76.56
Kelantan	52.27	99.21	81.86	85.01	72.78
Selangor	86.98	69.97	48.86	79.73	61.35
Perlis	37.42	56.83	53.25	64.64	37.80
WP Kuala Lumpur	57.27	67.92	47.24	41.94	33.46
WP Putrajaya/Cyberjaya	2.06	6.57	0.23	9.08	0.22
Negeri Sembilan	88.24	79.36	53.32	81.38	55.94
Melaka	63.71	98.80	60.69	60.47	43.52
Pahang	108.39	102.76	61.76	74.35	88.96
Terengganu	47.38	72.94	49.08	55.57	54.26
Semenanjung Malaysia I *Peninsular Malaysia*	**75.72**	**87.31**	**66.07**	**96.25**	**69.11**

Jadual A.13: SAIFI (Bilangan Gangguan/Pelanggan/Year) mengikut Tahap Voltan
Table A.13: SAIFI (Number of Interruptions/Customer/Year) by Voltage Level

Tahap Voltan I *Voltage Level*	2007	2008	2009	2010	2011
Voltan Tinggi I *High Voltage* (66 kV dan ke atas I *66 kV and above*)	0.02	0.017	0.02	0.01	0.01
Voltan Sederhana I *Medium Voltage* (6.6 kV – 33 kV)	0.73	0.759	0.67	1.17	0.93
Voltan Rendah I *Low Voltage* (1 kV dan ke bawah I *1 kV and below*)	0.08	0.091	0.06	0.05	0.02
Jumlah I *Total*	**0.83**	**0.87**	**0.76**	**1.23**	**0.97**

Jadual A.14: SAIFI (Bilangan Gangguan/Pelanggan/Year) mengikut Negeri
Table A.14: SAIFI (Number of Interruptions/Customer/Year) by State

Negeri | *State*	2007	2008	2009	2010	2011
Perak	0.76	0.93	0.86	2.35	1.81
Kedah	0.96	1.09	0.87	1.76	1.32
Johor	0.89	0.87	0.67	1.57	0.95
Pulau Pinang	1.26	1.41	1.50	1.46	1.06
Kelantan	0.73	1.16	1.25	1.75	1.48
Selangor	0.81	0.65	0.50	0.95	0.86
Perlis	0.67	0.73	0.68	0.86	0.48
WP Kuala Lumpur	0.52	0.52	0.52	0.48	0.44
WP Putrajaya/Cyberjaya	0.04	0.03	0.00	0.04	0.00
Negeri Sembilan	0.77	0.64	0.57	0.87	0.64
Melaka	0.80	1.03	0.86	0.71	0.60
Pahang	0.86	0.96	0.73	0.90	1.24
Terengganu	0.92	1.22	0.96	1.22	1.29
Semenanjung Malaysia I *Peninsular Malaysia*	**0.83**	**0.87**	**0.76**	**1.23**	**0.97**

Jadual A.15: CAIDI (Customer Average Interruption Duration Index) mengikut Tahap Voltan
Table A.15: CAIDI (Customer Average Interruption Duration Index) by Voltage Level

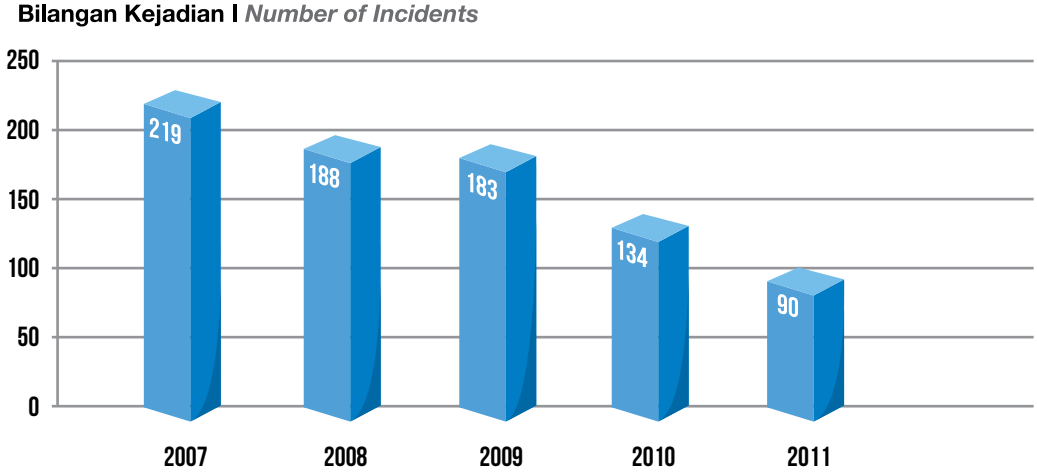
Tahap Voltan I *Voltage Level*	2007	2008	2009	2010	2011
Voltan Tinggi I *High Voltage* (66 kV dan ke atas I *66 kV and above*)	141.55	189.00	47.47	114.6	92.00
Voltan Sederhana I *Medium Voltage* (6.6 kV – 33 kV)	86.04	90.00	84.05	75.5	68.04
Voltan Rendah I *Low Voltage* (1 kV dan ke bawah I *1 kV and below*)	121.76	173.46	133.14	136.9	245.60
Jumlah I *Total*	**91.01**	**100.7**	**87.01**	**78.3**	**71.62**

Jadual A.16: CAIDI (Customer Average Interruption Duration Index) mengikut Negeri
Table A.16: CAIDI (Customer Average Interruption Duration Index) by State

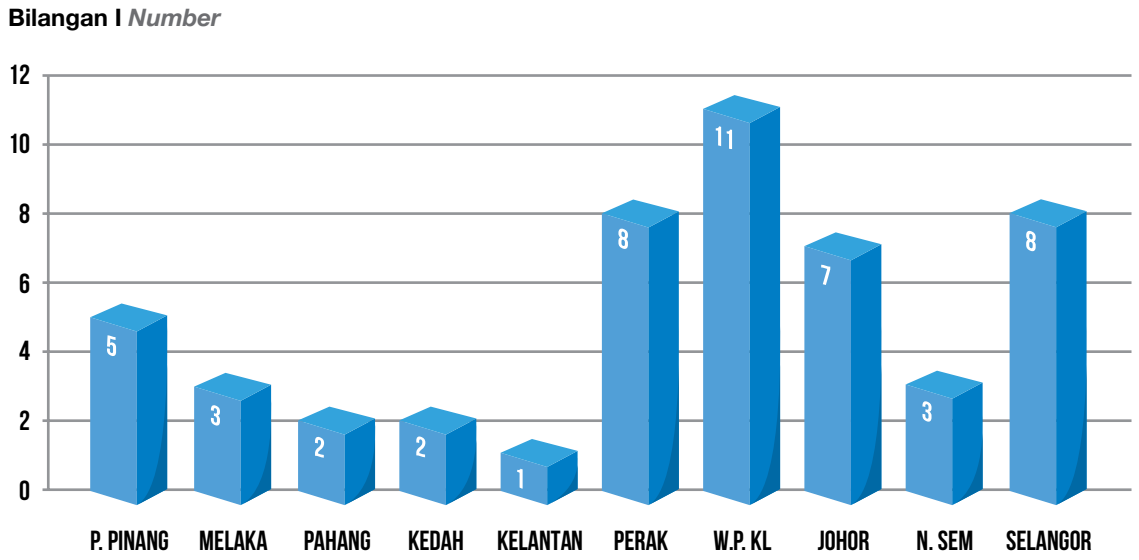
Negeri I *State*	2007	2008	2009	2010	2011
Perak	65.18	65.57	78.22	82.93	65.39
Kedah	78.01	106.73	89.14	72.50	55.55
Johor	101.96	137.88	119.02	76.19	77.25
Pulau Pinang	66.37	74.06	74.25	75.09	64.43
Kelantan	71.33	85.70	65.34	48.53	89.94
Selangor	107.73	108.29	96.95	83.77	63.07
Perlis	55.55	77.76	78.09	75.49	95.73
WP Kuala Lumpur	110.93	130.37	91.56	87.30	62.88
WP Putrajaya/Cyberjaya	50.91	225.55	98.92	211.99	52.00
Negeri Sembilan	113.91	123.22	112.06	93.59	79.68
Melaka	80.14	96.39	70.55	85.14	89.32
Pahang	125.90	107.40	84.86	82.16	42.69
Terengganu	51.53	59.97	50.99	45.72	83.62
Semenanjung Malaysia I *Peninsular Malaysia*	**91.01**	**100.70**	**87.01**	**78.25**	**71.62**

1.5 Kualiti Pembekalan Elektrik TNB
Electricity Supply Quality of TNB

Carta A.4: Kejadian Voltan Luar Biasa
Chart A.4: Reported Overvoltage Incidents



Carta A.5: Kejadian Voltan Luar Biasa yang Dilaporkan mengikut Negeri
Chart A.5: Reported Overvoltage Incidents by State



Jadual A.17: Kejadian Junaman Voltan yang Dilaporkan di Kawasan Perindustrian Utama mengikut Negeri
Table A.17: Reported Voltage Dip Incidents Reported in Major Industrial Areas by State

Negeri | *State*	2007	2008	2009	2010	2011
Pulau Pinang	25	13	11	2	5
Perlis	0	0	0	0	0
Melaka	0	0	0	2	3
Pahang	7	7	2	2	2
Terengganu	17	1	0	0	0
Kedah	0	1	0	2	2
Kelantan	0	0	0	9	1
Perak	4	5	27	14	8
WP Kuala Lumpur	0	25	24	11	11
WP Putrajaya/Cyberjaya	0	0	0	0	0
Johor	30	6	7	6	7
Negeri Sembilan	4	24	7	13	3
Selangor	9	31	6	36	8
Semenanjung Malaysia I *Peninsular Malaysia*	**96**	**113**	**84**	**97**	**40**

Jadual A.18: Bilangan Pengguna Terlibat dalam Insiden Junaman Voltan mengikut Negeri
Table A.18: Number of Consumers Involved in Voltage Dip Incidents by State

Negeri | *State*	2007	2008	2009	2010	2011
Pulau Pinang	95	17	12	3	6
Perlis	0	0	0	0	0
Melaka	0	0	0	2	3
Pahang	35	10	2	4	3
Terengganu	17	1	0	0	0
Kedah	0	1	0	2	2
Kelantan	0	0	0	9	1
Perak	4	5	33	22	13
WP Kuala Lumpur	0	34	32	18	1
WP Putrajaya / Cyberjaya	0	0	0	0	0
Johor	42	9	7	6	7
Negeri Sembilan	7	45	7	18	3
Selangor	18	90	14	91	12
Semenanjung Malaysia I *Peninsular Malaysia*	**218**	**212**	**107**	**175**	**51**

Jadual A.19: SARFI (System Average RMS Frequency Index)
Table A.19: SARFI (System Average RMS Frequency Index)

Sistem TNB | *TNB System*	$SARFI_{90}$	$SARFI_{80}$	$SARFI_{70}$
11 kV	24	14	9
22 kV	42	35	32
33 kV	27	14	10
Sistem Keseluruhan I *Overall System*	**27**	**17**	**12**

Jadual A.20: SARFI (System Average RMS Frequency Index): Perbandingan dengan Syarikat Utiliti yang Terpilih
Table A.20: SARFI (System Average RMS Frequency Index): Comparison with Selected Power Utility Companies

Utiliti Elektrik | *Electricity Utility*	$SARFI_{90}$	$SARFI_{80}$	$SARFI_{70}$
Singapore Power Grid	13	11	8
United State DPQ Project	50	27	18
Europe Mixed Systems (UNIPEDE)	103	0	44
Europe Cable Systems (UNIPEDE)	35	0	11
South Africa NRS-048 Indicate Level	153	78	47
Tenaga Nasional Berhad	**26**	**16**	**12**

Kualiti Perkhidmatan: Laporan Prestasi Tenaga Nasional Berhad (TNB) – berdasarkan *Guaranteed Service Level (GSL)*

Quality of Services: Performance Report of Tenaga Nasional Berhad (TNB) - based on Guaranteed Service Level (GSL)

No	Service Dimension	Service Indicator	Target	Penalty	Selangor	Perak	Johor	Kedah	Pahang	Kuala Lumpur	Pulau Pinang	Kelantan	Terengganu	Negeri Sembilan	Perlis	Melaka	Cyberjaya	Total
GSL 1	Availability of Supply: Frequency of Interruptions	Number of unplanned interruptions	4 per year (Bandaraya K.L & Putrajaya) & 5 per year (Other areas)	1. Domestic -1% of average bill or minimum RM10; 2. Commercial - 1% of average bill or maximum RM300; 3. Industrial - 0.5% of average bill or maximum RM1,000														
		Total interruptions			1,799	1,277	1,937	924	809	467	522	438	545	473	149	364	3	9,707
		Total incidents (not achieving target)			-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total penalty (RM)			-	-	-	-	-	-	-	-	-	-	-	-	-	-
GSL 2	Availability of Supply: Restoration Time	Time taken to restore electricity supply following outage	3 hrs (Minor fault); 4 hrs (Major fault- MV with feedback); 12 hrs (Major fault-MV without feedback); 8 hrs (grid/ transmission-partial blackout); 18 hrs (grid/ transmission-total blackout)	1. Domestic - 1% of average bill or minimum RM10; 2. Commercial - 1% of average bill or maximum RM300; 3. Industrial - 0.5% of average bill or maximum RM1,000														
		Total interruptions			1,799	1, 277	1,937	924	809	467	522	438	545	473	149	364	3	9,707
		Total incidents (not achieving target)			58	102	102	79	11	23	34	8	4	13	2	-	-	436
		Total penalty (RM)			2,230,670	2,261,400	1,314,350	1,368,760	988,860	804,980	810,850	138,510	89,930	72,270	16,440	-	-	10,097,020
GSL 3	Providing Supply	Time taken to implement service connection (overhead line) requiring low voltage cable installation work	7 working days	RM 50														
		Total service connection			3,299	5,955	5,241	5,272	3,438	1,477	5,276	6,529	4,771	1,580	987	1,485	6	45,316
		Total service connection not completed in 7 working days			841	656	1,356	701	671	224	278	538	524	221	51	104	2	6,167
		Total penalty (RM)			42,050	32,800	67,800	35,050	33,550	11,200	13,900	26,900	26,200	11,050	2,550	5,200	100	308,350
		Time taken to implement service connection (underground cable) requiring low voltage cable installation work	21 working days	RM 50														
		Total service connection			2,020	794	1,343	1,248	1,214	1,248	1,666	1,763	1,056	737	95	730	33	13,947
		Total service connection not completed in 21 working days			448	91	332	150	263	267	167	74	23	74	8	44	15	1,956
		Total penalty (RM)			22,400	4,550	16,600	7,500	13,150	13,350	8,350	3,700	1,150	3,700	400	2,200	750	97,800

No	Service Dimension	Service Indicator	Target	Penalty	Selangor	Perak	Johor	Kedah	Pahang	Kuala Lumpur	Pulau Pinang	Kelantan	Terengganu	Negeri Sembilan	Perlis	Melaka	Cyberjaya	Total
GSL 4	Providing Supply	*Time taken to connect new electricity supply for individual domestic low voltage consumer*	*5 working days*	*RM 50*														
		Total supply connection			19,521	13,469	18,008	12,904	6,578	12,023	11,772	8,239	6,970	7,228	1,850	5,830	132	124,524
		Total supply connection not completed in 5 working days			2,112	1,410	2,229	1,020	585	1,765	834	140	174	742	63	124	15	11,213
		Total penalty (RM)			105,600	70,500	111,450	51,000	29,250	88,250	41,700	7,000	8,700	37,100	3,150	6,200	750	560,650
GSL 5	Customer Contact	*Disconnection of supply according to the applicable legislation or disconnection procedures*	*0*	*RM 100*														
		Total disconnections			87,487	63,616	44,481	45,340	10,413	68,771	37,303	31,365	11,489	28,526	5,004	16,736	3,337	453,868
		Total disconnection not done with procedures			1	1	2	-	-	7	1	-	1	2	-	1	-	16
		Total penalty (RM)			100	100	200	-	-	700	100	-	100	200	-	100	-	1,600
Total Penalty in RM for GSL 3, 4, 5 according to states					**2,400,820**	**2,369,350**	**1,510,400**	**1,462,310**	**1,064,810**	**918,480**	**874,900**	**176,110**	**126,080**	**124,320**	**22,540**	**13,700**	**1,600**	**11,065,420**
Total Penalty in RM - Nationwide (GSL 1, 2, 3, 4, 5)					**11,065,420**													

Nota I *Note:*
*GSL 1 & 2 hanya akan berkuatkuasa selepas Sistem Maklumat Korporat Geospatial (CGIS) disiapkan I *GSL 1 & 2 will only take effect after the Corporate Geospatial Information System (CGIS) is completed.*

Sumber I *Source* : Tenaga Nasional Berhad

Tahun Kalendar 2011 I *Calendar Year 2011*

Kualiti Perkhidmatan: Laporan Prestasi Tenaga Nasional Berhad (TNB) – berdasarkan *Minimum Service Level (MSL)*

Quality of Services: Performance Report of Tenaga Nasional Berhad (TNB) - based on Minimum Service Level (MSL)

No	Service Indicator	Service Standard	Kuala Lumpur	Pulau Pinang	Melaka	Perlis	Kedah	Pahang	Perak	Putrajaya/ Cyberjaya	Terengganu	Negeri Sembilan	Selangor	Kelantan	Johor	Total/ Average %
1	***Availability of supply***	*> 2 days*														
	1a. Minimum duration of notice for planned / scheduled interruptions of electricity supply															
	Total notices served		1,286	2,258	543	116	1,023	529	1,334	-	191	1,098	6,411	902	2,552	18,243
	Total notices served more than 2 days before planned/scheduled interruptions		1,264	2,254	538	116	1,003	515	1,309	-	183	1,087	6,299	870	2,526	17,964
	(%) Compliance		98.29	99.82	99.08	100.00	98.04	97.35	98.13	-	95.81	99.00	98.25	96.45	98.98	98.47
	1b. Upon request, time taken to provide initial information to consumer who report on electricity interruptions	*< 1 hour*														
	Total requests from consumers		33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560	33,560
	Total requests replied less than 1 hour		33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506	33,506
	(%) Compliance		99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84	99.84
2	***Quality of Supply***	*< 2 days*														
	2a. Time taken to rectify voltage complaint or limit violation															
	Total complaints received		1	17	2	-	11	17	2	-	4	3	10	5	4	76
	Total complaints solved less than 2 days		1	16	2	-	10	17	2	-	3	2	7	4	4	68
	(%) Compliance		100.00	94.12	100.00	-	90.91	100.00	100.00	-	75.00	66.67	70.00	80.00	100.00	89.47
	2b. Time taken to correct voltage complaint which requires network reinforcement	*< 180 days*														
	Total complaints received		-	4	-	-	1	4	-	-	-	1	-	-	-	10
	Total complaints solved less than 180 days		-	4	-	-	1	4	-	-	-	1	-	-	-	10
	(%) Compliance		-	100.00	-	-	100.00	100.00	-	-	-	100.00	-	-	-	100.00
	2c. Time taken to complete investigation of over voltage and under voltage complaints from complaint received date	*< 30 working days*														
	Total complaints received		2	7	-	-	4	20	-	-	5	4	2	-	8	52
	Total complaints solved less than 30 working days		2	7	-	-	4	20	-	-	5	4	2	-	8	52
	(%) Compliance		100.00	100.00	-	-	100.00	100.00	-	-	100.00	100.00	100.00	-	100.00	100.00

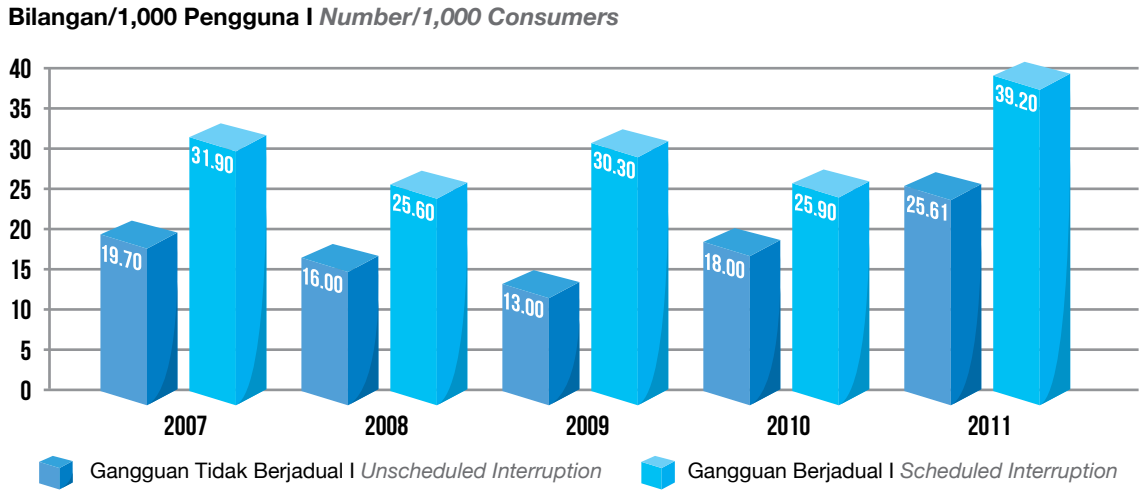
No	Service Indicator	Service Standard	Kuala Lumpur	Pulau Pinang	Melaka	Perlis	Kedah	Pahang	Perak	Putrajaya/ Cyberjaya	Terengganu	Negeri Sembilan	Selangor	Kelantan	Johor	Total/ Average %
3	***Providing supply***	< 14 days														
	3a. Time taken to process electricity supply application and to reply to applicant		9,029	11,490	4,535	1,812	11,806	6,956	14,662	109	6,502	5,980	17,241	8,460	14,516	113,098
	Total no. of contribution charge letters issued		8,944	11,458	4,507	1,809	11,654	6,882	14,623	106	6,475	5,973	17,070	8,454	14,461	112,416
	Total no. of contribution charge letters issued less than 14 days		99.06	99.72	99.38	99.83	98.71	98.94	99.73	97.25	99.58	99.88	99.01	99.93	99.62	99.40
	3b. Time taken to implement electrification scheme requiring new substation after handing over of substation building (up to 33kV) by TNB	*< 120 days*														
	Total no. of projects given supply		258	120	94	46	178	82	190	11	83	134	797	60	482	2,535
	Total no. of projects given supply less than 120 days		255	115	93	45	165	75	183	11	74	118	788	60	473	2,455
	(%) Compliance		98.84	95.83	98.94	97.83	92.70	91.46	96.32	100.00	89.16	88.06	98.87	100.00	98.13	96.84
	3c. Waiting time at site for appointment to connect electricity supply. (Unavoidable occurrence must be followed up by returning call within 1 hour before the appointment time)	*1 hour*														
	Total appointment made		39,163	26,387	13,545	3,421	23,390	18,082	31,142	1,962	12,769	17,548	61,004	16,432	44,431	309,276
	Total appointment met within 1 hour of appointment time		39,163	26,387	13,545	3,421	23,390	18,082	31,142	1,962	12,769	17,548	61,004	16,432	44,431	309,276
	(%) Compliance		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	3d. Time taken to inform the developer of the connection charges to be paid upon receipt of complete application	*< 60 days*														
	No. of contribution charge letters issued		314	241	212	57	71	111	199	55	60	310	1,284	132	228	3,274
	No. of contribution charge letters issued less than 60 days		308	229	199	56	65	105	191	55	55	307	1,242	131	220	3,163
	(%) Compliance		98.09	95.02	93.87	98.25	91.55	94.59	95.98	100.00	91.67	99.03	96.73	99.24	96.49	96.61

No	Service Indicator	Service Standard	Kuala Lumpur	Pulau Pinang	Melaka	Perlis	Kedah	Pahang	Perak	Putrajaya/ Cyberjaya	Terengganu	Negeri Sembilan	Selangor	Kelantan	Johor	Total/ Average %
4	**Customer Contact**	< 7 working days														
	4a. Time taken to reply to written enquiry or complaint															
	Total written enquiries/complaints received		3,019	1,945	699	94	1,092	892	2,231	113	609	1,161	4,905	883	2,626	20,269
	Total written enquiries/complaints replied less than 7 working days		2,989	1,936	699	93	1,084	889	2,219	113	605	1,156	4,817	876	2,618	20,094
	(%) Compliance		99.01	99.54	100.00	98.94	99.27	99.66	99.46	100.00	99.34	99.57	98.21	99.21	99.70	99.14
	4b. Average queuing time at customer service counter	< 20 minutes														
	Total customers served		967,349	518,083	273,449	72,474	440,495	328,188	518,310	60,822	262,587	329,809	861,578	192,034	891,283	5,716,461
	Total customers served less than 20 minutes		884,589	488,409	244,402	68,540	402,823	316,881	484,014	57,380	254,878	312,027	801,584	181,174	845,820	5,342,521
	(%) Compliance		91.44	94.27	89.38	94.57	91.45	96.55	93.38	94.34	97.06	94.61	93.04	94.34	94.90	93.46
	4c. Average time taken by customer service officer at CMC 15454 to pick up ringing telephone.	< 30 seconds														
	Total incoming calls received		2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332	2,693,332
	Total incoming calls answered within 30 seconds		2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459	2,504,459
	(%) Compliance		92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99	92.99
5	**Metering Services**	< 2 working days														
	5a. Time taken to attend to meter problem upon official notification/request by the consumer (appointment, visit, testing, etc)															
	No. of appointments, visit, testing completed		69	894	261	92	89	38	243	21	115	244	343	80	343	2,832
	No. of appointments, visit, testing completed within 2 working days		66	885	260	89	89	33	224	17	114	237	302	64	173	2,553
	(%) Compliance		95.65	98.99	99.62	96.74	100.00	86.84	92.18	80.95	99.13	97.13	88.05	80.00	50.44	90.15
	5b. Time taken to respond to metering problem or dispute upon official notification/request by the consumer (replace, relocate, etc)	< 3 working days														
	No. of meter replacement/relocation completed		56	229	83	28	51	16	41	0	29	134	189	10	131	997
	No. of meter replacement/relocation completed within 3 working days		54	221	80	26	51	15	36	0	28	127	181	9	116	944
	(%) Compliance		96.43	96.51	96.39	92.86	100.00	93.75	87.80	0	96.55	94.78	95.77	90.00	88.55	94.68
	5c. Time interval between successive rendering of bill(s)															
	Total no. of customers (OPC)	1 month	12,258,288	6,839,719	3,451,262	870,977	7,168,504	5,075,369	9,503,658	537,684	3,586,040	4,673,444	18,763,722	4,740,148	13,158,961	90,627,776
	Total no. of billed customers		12,256,290	6,839,684	3,451,251	870,976	7,168,159	5,075,217	9,503,617	537,176	3,586,003	4,672,999	18,760,316	4,739,661	13,152,412	90,613,761
	(%) Compliance		99.98	100.00	100.00	100.00	100.00	100.00	100.00	99.91	100.00	99.99	99.98	99.99	99.95	99.98
Average 12 month (%) Compliance			**97.83**	**97.78**	**97.65**	**97.65**	**97.03**	**96.8**	**96.6**	**96.53**	**95.44**	**95.44**	**95.05**	**94.77**	**94.26**	**96.74**
Average 12 month (%) Compliance									**96.74**							

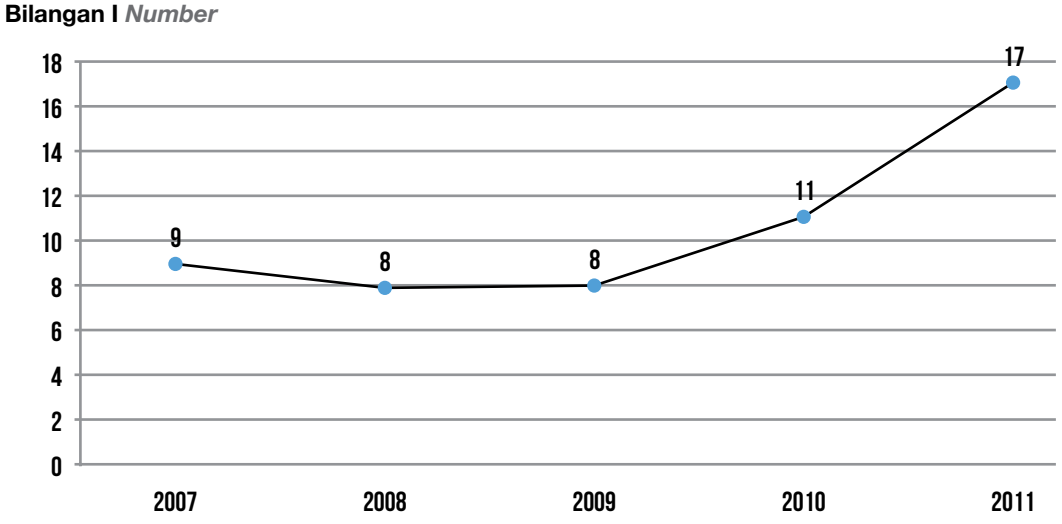
Sumber I *Source* : Tenaga Nasional Berhad

1.6 Sistem Pengagihan NUR Distribution Sdn Bhd di Kulim Hi-Tech Park (KHTP)
Electricity Distribution System by NUR Distribution Sdn Bhd in KHTP

Carta A.6: Gangguan Bekalan Elektrik per 1,000 Pengguna
Chart A.6: Electricity Supply Interruptions per 1,000 Consumers



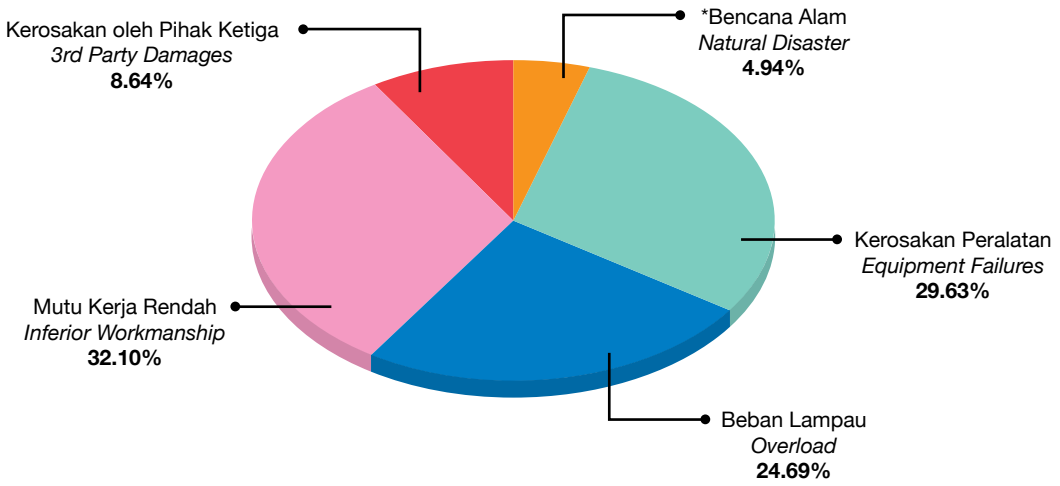
Carta A.7: Purata Gangguan Bekalan Elektrik Bulanan
Chart A.7: Monthly Average Electricity Supply Interruptions



Jadual A.21: Bilangan Gangguan Bekalan Elektrik
Table A.21: Number of Electricity Supply Interruptions

Bilangan | *Number*	2007	2008	2009	2010	2011
Gangguan Tidak Berjadual I *Unscheduled Interruptions*	40	35	30	53	81
Gangguan Berjadual I *Scheduled Interruptions*	65	56	70	76	124
Jumlah Gangguan I *Total Interruptions*	**105**	**91**	**100**	**129**	**205**

Carta A.8: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan
Chart A.8: Percentage of Unscheduled Supply Interruption by Type of Interruptions

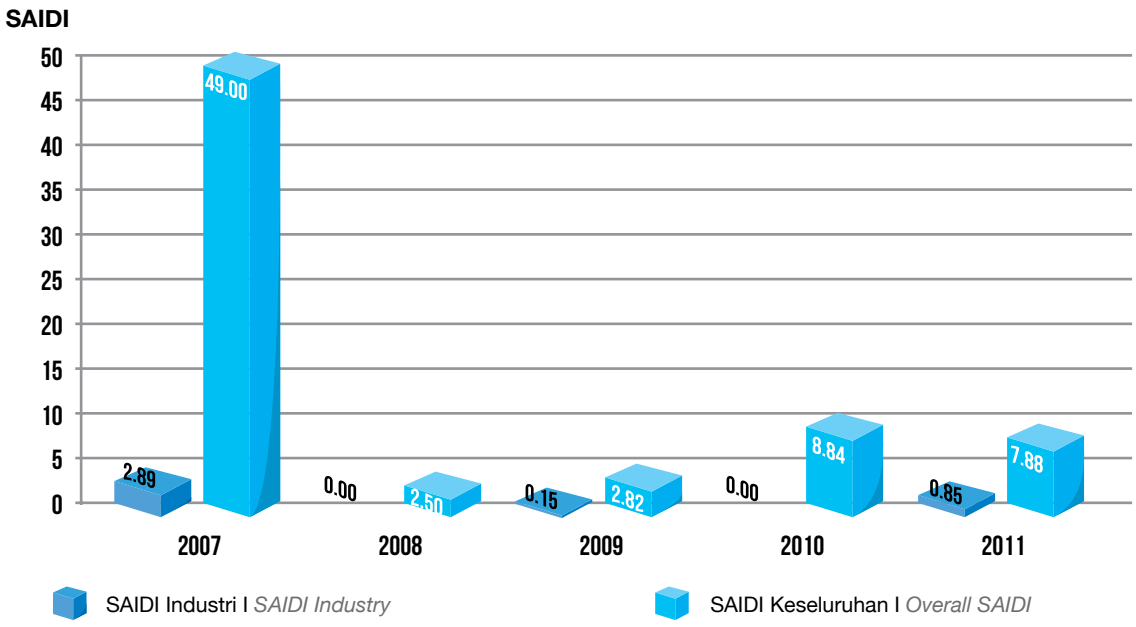


Bilangan Keseluruhan Gangguan Bekalan Elektrik Tidak Berjadual = 81
Total Number of Unscheduled Interruptions = 81

Nota I *Note:*
* Bencana Alam disebabkan angin, ribut, banjir, tanah runtuh dan lain-lain I *Natural disasters caused by wind, storm, flood, landslides, etc.*

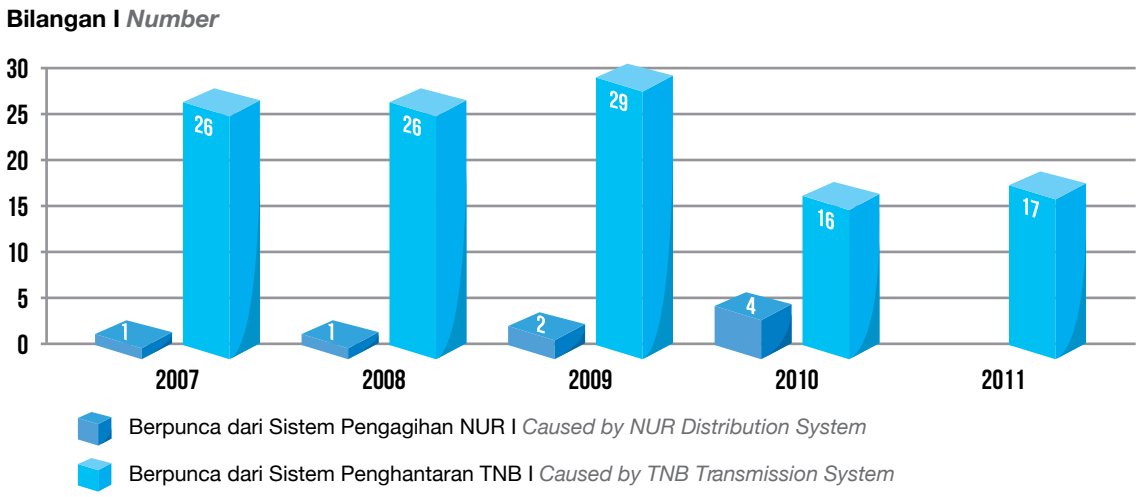
1.7 NUR Distribution Sdn Bhd: System Average Interruption Duration Index (SAIDI)

Carta A.9: SAIDI (Minit/Pelanggan/Tahun)
Chart A.9: SAIDI (Minutes/Customer/Year)

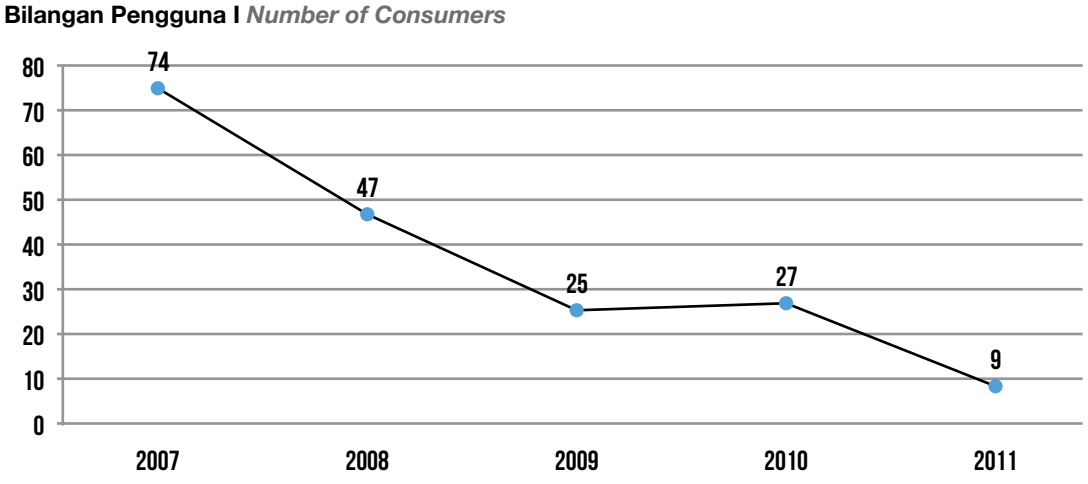


1.8 Kualiti Pembekalan Elektrik NUR Distribution Sdn Bhd
Electricity Supply Quality of NUR Distribution Sdn Bhd

Carta A.10: Kejadian Junaman Voltan yang Dilaporkan di KHTP
Chart A.10: Reported Voltage Dips Incidents in KHTP



Carta A.11: Bilangan Pengguna yang Terlibat dengan Insiden Junaman Voltan
Chart A.11: Number of Consumers Involved in Voltage Dips Incidents



Jadual A.22: SARFI (System Average RMS Frequency Index)
Table A.22: SARFI (System Average RMS Frequency Index)

	2007	2008	2009	2010	2011
Berpunca dari Sistem Pengagihan NUR I *Caused by NUR Distribution System*	0	0	1	1	0
Berpunca dari Sistem Penghantaran TNB I *Caused by TNB Transmission System*	4	2	1	1	0

Kualiti Perkhidmatan: Prestasi NUR Distribution Sdn Bhd
Quality of Services: Performance of NUR Distribution Sdn Bhd

Details	2007	2008	2009	2010	2011
1. Connection of Electricity Supply					
A. Change of Consumers					
• *No. of applications*	20	21	6	13	63
• *Percentage of connection within 1 working day after an appointment for connection*	100%	100%	100%	100%	100%
B. New Supply (Low Voltage)					
i. Individual Applications under Normal Conditions					
• *No. of applications*	117	144	120	594	207
• *Percentage of connection within 1 working day after an appointment for connection*	100%	100%	100%	100%	100%
ii. Bulk Supply Applications and Housing Schemes					
• *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
2. Supply Restoration After Breakdowns					
i. Reports					
• *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
ii. Minor Breakdowns					
• *No. of minor breakdowns*	16	20	13	33	40
• *Percentage of breakdown rectified within 2 hours*	100%	100%	86.7%	93.9%	80.0%
iii. Major/Extra Ordinary Breakdowns					
• *No. of major breakdowns*	24	15	15	20	41
• *Percentage of restoration within 24 hours*	100%	100%	100%	85%	95.12%
3. Supply Reconnection After Disconnection					
• *No. of supply disconnections*	152	92	85	33	122
• *No. of consumer bills paid before 1:00 p.m. on disconnection day*	152	92	85	33	122
• *Percentage of supply reconnection on the same day for bills paid before 1:00 p.m.*	100%	100%	100%	100%	100%
4. Supply Interruptions which are Planned/Scheduled					
• *No. of scheduled interruptions*	39	32	40	46	79
• *Percentage of consumers given 7 days notice before scheduled interruptions*	92%	88%	95%	91.3%	91.1%
5. Meter Reading					
• *No. of consumers with estimated readings exceeding 2 consecutive months*	47	59	32	73	23
• *Notice given to customers with estimated readings exceeding 2 consecutive months (%)*	100%	100%	100%	100%	100%
6. Enquiries/Written Complaints from Consumers					
i. Written enquiries including question regarding accounts/bills					
• *No. of written complaints received*	54	61	115	93	84
• *Percentage of reply within 5 working days*	100%	100%	100%	100%	100%
7. Service Counter					
• *Percentage of consumers whose waiting time did not exceed 20 minutes*	n/a	n/a	n/a	n/a	n/a

Kualiti Perkhidmatan: Prestasi NUR Distribution Sdn Bhd
Quality of Services: Performance of NUR Distribution Sdn Bhd

Details	2007	2008	2009	2010	2011
8. Appointment for Meter Accuracy Check					
• *No. of appointments for meter accuracy check*	14	14	5	8	6
• *Percentage of meter accuracy check carried out within 1 working day*	100%	100%	100%	100%	100%
9. Meter Replacement					
• *No. of meter replacement*	5	9	5	3	9
• *Percentage of meter replacement within 2 working days*	100%	100%	100%	100%	100%
10. Appointment with Consumers					
i. For appointments outside NUR Premises					
• *No. of appointments where NUR officers arrived not later than 15 minutes from the agreed time*	193	316	184	648	276
ii. Postponement by NUR					
• *Percentage of subsequent appointment made within 1 working day*	100%	100%	100%	98.5%	100%
11. Deposits					
• *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 had the excess deposits returned*	n/a	n/a	n/a	n/a	n/a
12. Refund of Consumer Deposits					
• *No. of consumers who had forwarded all required documents for refund of deposits*	88	81	124	102	111
• *Percentage of consumers who had their deposits refunded within 15 working days*	88%	100%	100%	100%	100%
13. Collection					
• *Percentage of proof of payment sent via mail within 5 working days*	98%	100%	100%	100%	100%
14. Supply Disconnection					
i. With 24 Hours Notice					
• *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
ii. Without Any Notice					
• *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*	162	94	86	45	142
• *No. of disconnections of installations which are dangerous*	0	0	0	0	9
15. Special Consumers Who Face Problems in Paying Electric Bills					
• *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

Kualiti Perkhidmatan: Prestasi NUR Distribution Sdn Bhd
Quality of Services: Performance of NUR Distribution Sdn Bhd

Details	2007	2008	2009	2010	2011
16. Voltage Not in Compliance with Standards					
i. No Enhancement Work on Network is Required					
• *No. of complaints*	2	1	6	3	10
• *Percentage of complaints settled within 2 days from the date of complaint*	100%	100%	100%	100%	100%
ii. Network Enhancement Work is Required					
• *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
17. New/Increase of Supply Application Reply					
i. No New Substation Required					
• *No. of applications*	8	10	3	7	12
• *Percentage of applications being replied within 1 week from the date of application*	100%	100%	100%	100%	100%
ii. New Substation Required					
• *No. of applications*	0	3	2	0	4
• *Percentage of applications being replied within 2 weeks from the date of application*	n/a	100%	100%	n/a	100%
18. Transferring of Meter Location upon Consumer Request					
• *No. of applications for meter relocation from consumers which was felt as necessary and applicable*	1	9	2	7	8
• *Percentage of applications which felt necessary and applicable being settled within 7 working days*	100%	100%	100%	100%	100%
19. Education on Energy Efficiency					
• *No. of consumers education programmes on energy efficiency and electricity accident, including the activities near installation and electricity lines*	4	4	4	4	4
20. Power Quality Improvement					
• *No. of activities to improve power quality*	67	49	66	49	61

Nota I *Note*:
n/a - Tiada maklumat I *Not Available*

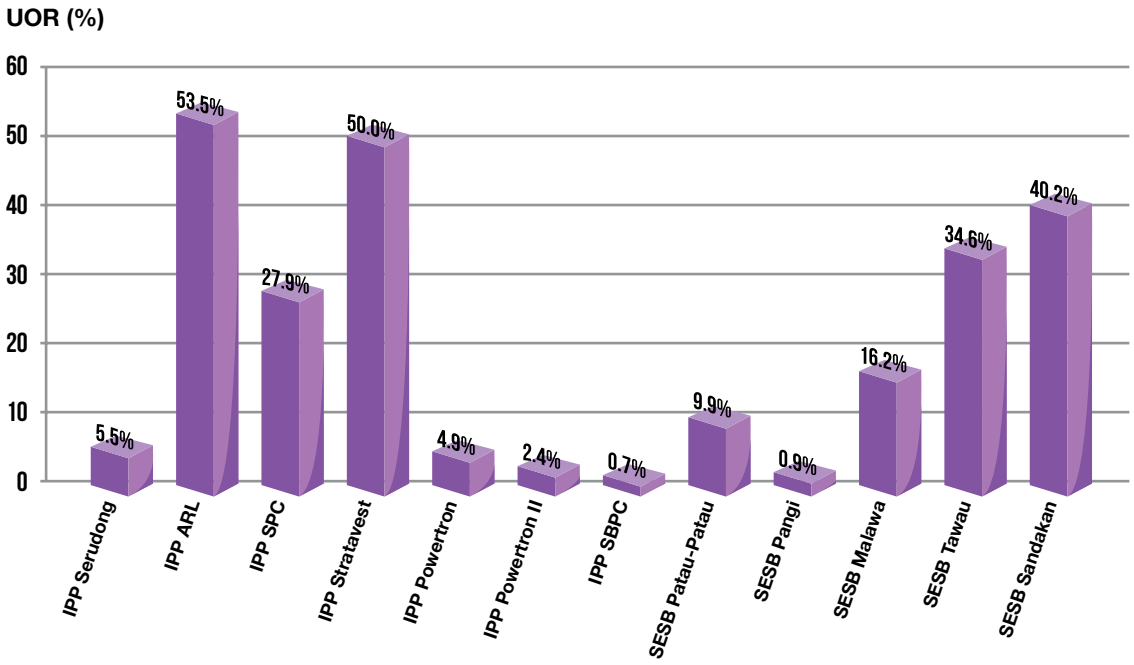
Tahun Kalender 2011 I ***Calender Year 2011***

Sumber I *Source*:
NUR Distribution Sdn Bhd

2. Prestasi Pembekalan dan Perkhidmatan Elektrik di Sabah
Performance of Electricity Supply and Services in Sabah

2.1 Sistem Penjanaan Sabah Electricity Sdn Bhd (SESB) dan IPP di Sabah
Generation System of Sabah Electricity Sdn Bhd (SESB) and IPPs in Sabah

Carta A.12: Kadar Hentitugas Tidak Berjadual (UOR)
Chart A.12: Unplanned Outage Rate (UOR)



Jadual A.23: Purata Kecekapan Thermal (%), Faktor Kesediaan Setara (EAF) (%) dan Faktor Henti Tugas Tidak Berjadual Setara (EUOF) (%)
Table A.23: Average Thermal Efficiency (%), Equivalent Availability Factor (EAF) (%) and Equivalent Unplanned Outage Factor (EUOF) (%)

Jenis Loji I *Plant Type*	Purata Kecekapan Thermal *Average Thermal Efficiency (%)*		EAF (%)		EUOF (%)	
	SESB	IPP	SESB	IPP	SESB	IPP
Kitar Padu I *Combined Cycle*	24.90	38.05	70.91	95.19	11.49	3.31
Disel I *Diesel*	29.06	38.69	58.53	71.72	30.79	27.06
Hidro I *Hydro*	-	-	90.68	-	0.94	-

2.2 Sistem Penghantaran SESB
SESB Transmission System

Jadual A.24: Pelantikan Bulanan bagi Sistem Penghantaran dengan Kehilangan Beban sebanyak 50 MW dan ke Atas
Table A.24: Monthly Trippings of Transmission System with Load Loss of 50 MW and Above

Petunjuk *Indicator*	Sept *Sept*	Okt *Oct*	Nov *Nov*	Dis *Dec*	Jan *Jan*	Feb *Feb*	Mac *Mar*	Apr *Apr*	Mei *May*	Jun *June*	Jul *Jul*	Ogos *Aug*
Bilangan Pelantikan Tanpa Lucutan Beban I *Number of Trippings Without Load Shedding*	0	0	0	0	0	0	1	0	0	0	0	0
Bilangan Pelantikan Dengan Lucutan Beban I *Number of Trippings With Load Shedding*	1	0	0	0	0	1	0	0	0	0	0	0
Kehilangan Beban Maksimum (MW) *Maximum Load Losses (MW)*	194.16	-	-	-	-	88.53	65.15	-	-	-	-	-
Tenaga Yang Tidak Dibekalkan Semasa Pelantikan (MWj) *Unsupplied Energy During Trippings (MWh)*	-	-	-	-	-	-	4,146.6	-	-	-	-	-
Purata Tenaga Tidak Dibekalkan Setiap Pelantikan (MWj) *Average Unsupplied Energy During Trippings (MWh)*	-	-	-	-	-	-	4,146.6	-	-	-	-	-
Purata Tempoh Setiap Pelantikan (Jam: Minit) I *Average Duration Per Tripping (Hour: Minutes)*	2:59	-	-	-	-	1:53	1:27	-	-	-	-	-
Tenaga Tidak Dibekalkan Semasa Lucutan Beban (MWj) *Unsupplied Energy During Load Shedding (MWh)*	14,821.6	-	-	-	-	7,099.21	-	-	-	-	-	-

Tahun Kewangan 2010/11 I *Financial Year 2010/11*

Jadual A.25: Delivery Point Unreliability Index (DePUI) - System Minutes SESB
Table A.25: Delivery Point Unreliability Index (DePUI) - System Minutes SESB

Tahun | *Year*	2007	2008	2009	2010	2011
Termasuk Bekalan Elektrik Terputus I *Including Blackout*	-	154.38	-	-	-
Tidak Termasuk Bekalan Elektrik Terputus I *Excluding Blackout*	18.99	11.89	31.58	20.21	40.13

Tahun Kewangan 2010/11 I *Financial Year 2010/11*

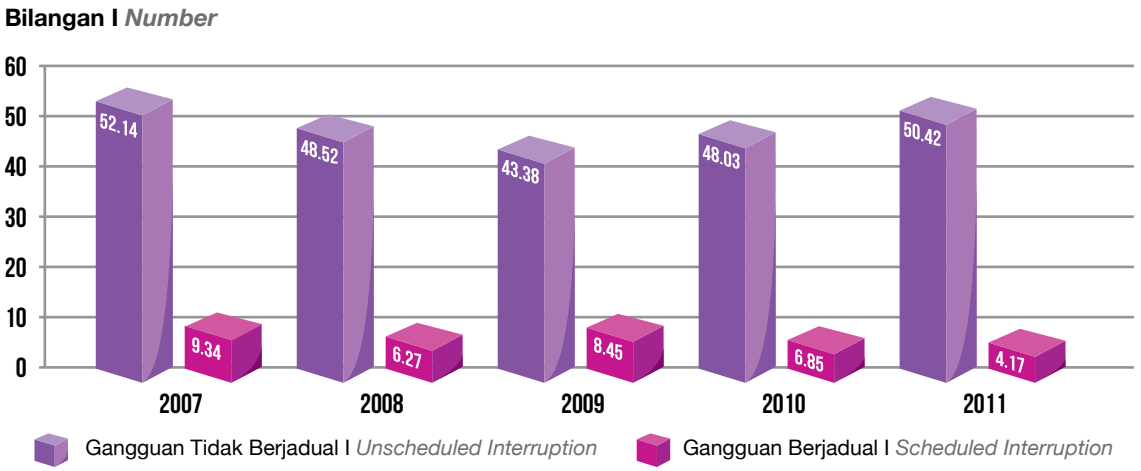
Jadual A.26: Insiden Pelantikan bagi Talian/Kabel per 100 cct-km mengikut Tahap Voltan
Table A.26: Lines/Cables Tripping Incidents per 100 cct-km by Voltage Level

Tahun | *Year*	2007	2008	2009	2010	2011
275 kV	-	-	0.2	0.2	0.2
132 kV	5.35	0.28	0.44	0.12	0.42
66 kV	4.51	5.51	4.34	16.34	6.68

Tahun Kewangan 2010/11 I *Financial Year 2010/11*

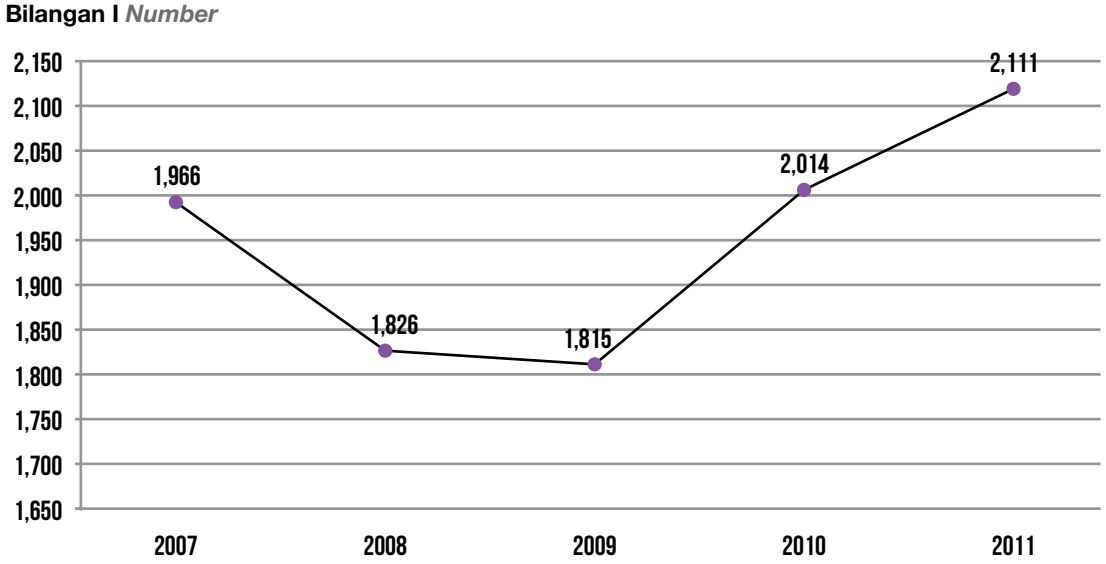
2.3 Sistem Pengagihan SESB
SESB Distribution System

Carta A.13: Gangguan Bekalan Elektrik per 1,000 Pengguna
Chart A.13: Electricity Supply Interruptions per 1,000 Consumers



Nota I *Note*:
Tidak termasuk gangguan pada sistem penjanaan dan penghantaran I *Excluding the interruptions in generation and transmission systems*

Carta A.14: Purata Bulanan Gangguan Bekalan Elektrik
Chart A.14: Monthly Average Electricity Supply Interruptions

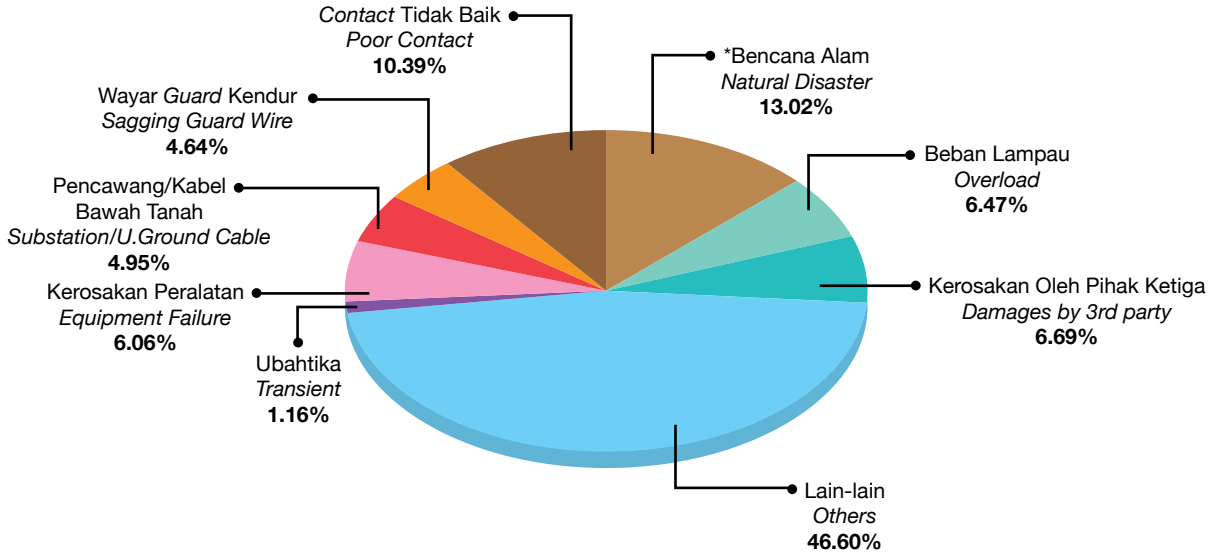


Nota I *Note*:
Tidak termasuk gangguan pada sistem penjanaan dan penghantaran I *Excluding the interruptions in generation and transmission systems*

Jadual A.27: Insiden Pelantikan bagi Talian/Kabel per 100 cct-km mengikut Tahap Voltan
Table A.27: Lines/Cables Tripping Incidents per 100 cct-km by Voltage Level

Bilangan | *Number*	2007	2008	2009	2010	2011
Gangguan Tidak Berjadual | *Unscheduled Interruptions*	20,006	19,484	18,228	21,157	23,397
Gangguan Berjadual I *Scheduled Interruptions*	3,583	2,427	3,550	3,016	1,937
Jumlah Gangguan I *Total Interruptions*	**23,589**	**21,911**	**21,778**	**24,173**	**25,334**

Carta A.15: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan
Chart A.15: Percentage of Unscheduled Supply Interruption by Type of Interruptions

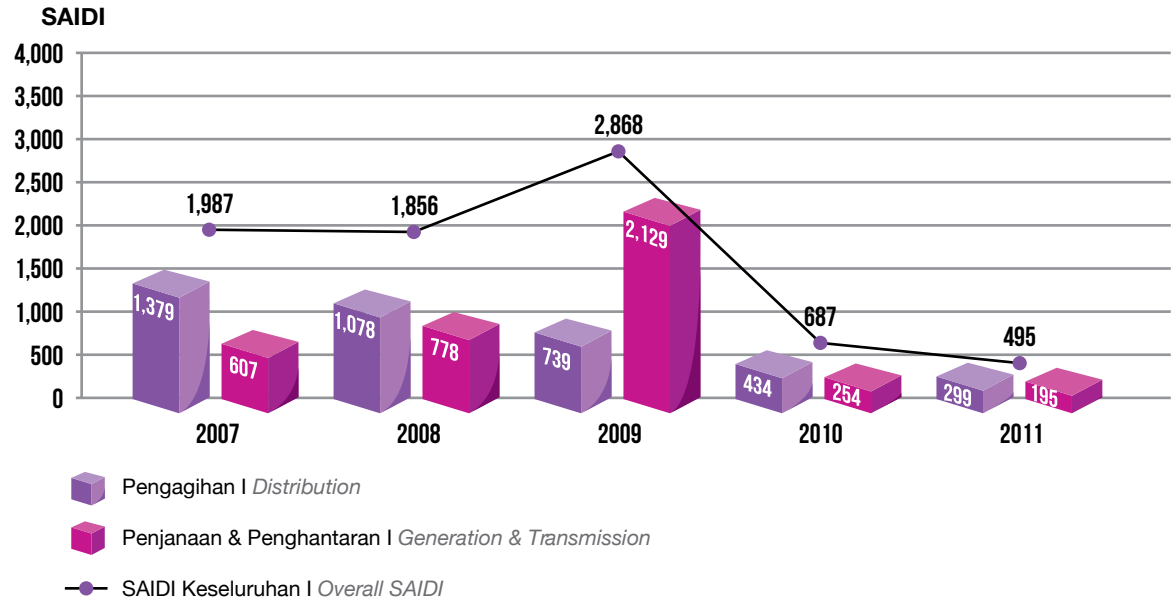


Bilangan Keseluruhan Gangguan Bekalan Elektrik Tidak Berjadual = 23,397
Total Number of Unscheduled Interruptions = 23,397

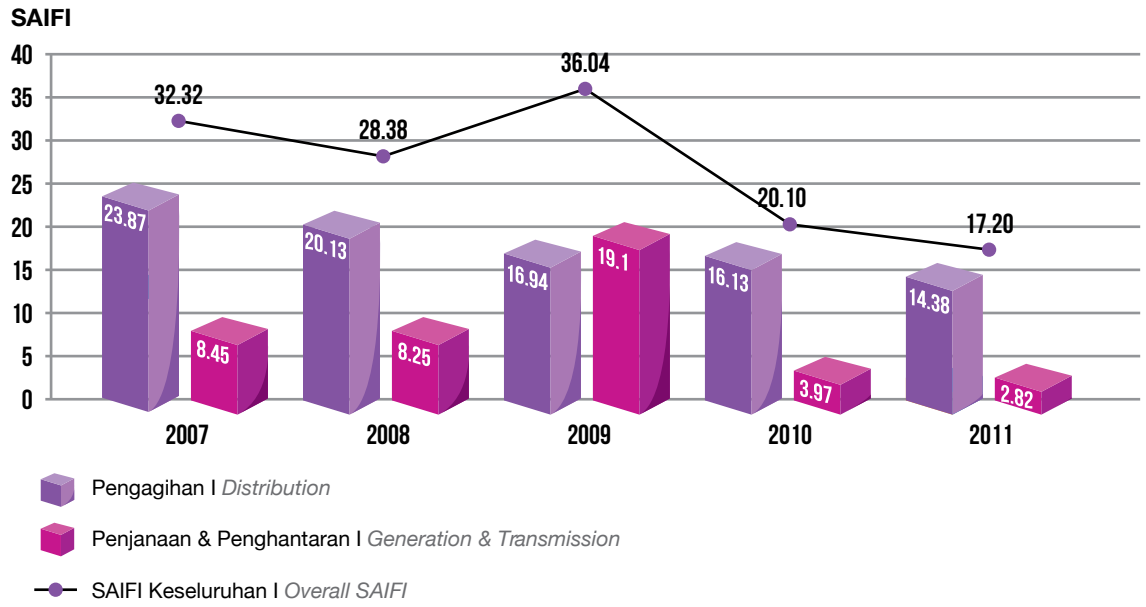
Nota I *Note*:
* Bencana Alam disebabkan angin, ribut, banjir, tanah runtuh dan lain-lain I *Natural disaster caused by wind, storm, flood, landslides, etc.*

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

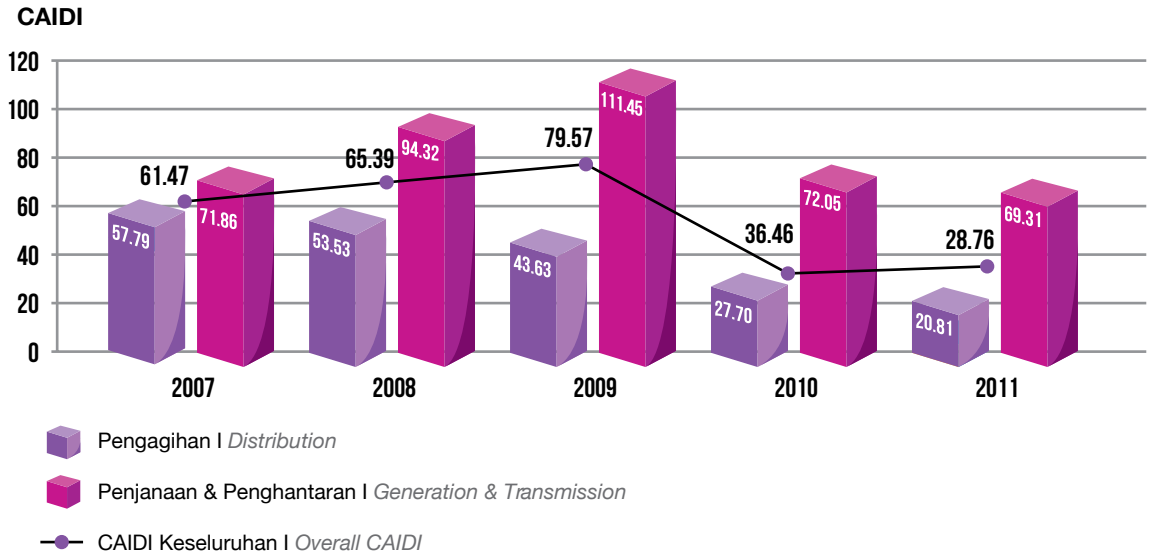
Carta A.16: SAIDI (Minit/Pelanggan/Tahun)
Chart A.16: SAIDI (Minutes/Customer/Year)



Carta A.17: SAIFI (Bilangan Gangguan/Pelanggan/Year)
Chart A.17: SAIFI (Number of Interruptions/Customer/Year)



Carta A.18: CAIDI (Customer Average Interruption Duration Index)
Chart A.18: CAIDI (Customer Average Interruption Duration Index)



Kualiti Perkhidmatan: Prestasi Sabah Electricity Sdn Bhd (SESB)
Quality of Services: Performance of Sabah Electricity Sdn Bhd (SESB)

Details	2007	2008	2009	2010	2011
1. Connection of Electricity Supply					
A. Change of Consumers					
• *No. of applications*	13,213	7,638	6,893	7,600	12,209
• *Percentage of connection within 1 working day after an appointment for connection*	90.3%	90.0%	79.0%	80.9%	92.0%
B. New Supply (Low Voltage)					
i. Individual Applications under Normal Conditions					
• *No. of applications*	10,466	11,741	12,491	15,742	17,000
• *Percentage of connection within 2 working days after an appointment for connection*	83.0%	68.6%	62.4%	67.6%	70.0%
ii. Bulk Supply Applications and Housing Schemes					
• *No. of applications*	5,712	6,352	6,340	6,645	5,493
• *Percentage of connection within 2 weeks after an appointment for connection*	77.6%	89.9%	96.7%	91.6%	94.6%
2. Supply Restoration After Breakdowns					
i. Complaints					
• *No. of complaints*	247,927	248,957	190,251	209,508	55,638
• *No. of consumers where the information was not available at that time was contacted again within 15 minutes*	2,060	2,819	3,775	5,897	52,856
• *Percentage of consumers being given complaint numbers*	95.5%	95.0%	95.0%	95.5%	37.85%
• *Percentage of consumers where the information was not available at that time was contacted again within 15 minutes*	0.83%	1.13%	1.9%	2.8%	95.0%
ii. Minor Breakdowns					
• *No. of minor breakdowns*	20,857	20,268	17,981	19,513	19,547
• *Percentage of breakdown rectified within 2 hours*	78.9%	92.8%	93.0%	99.0%	95.0%
iii. Major/Extra Ordinary Breakdowns					
• *No. of major breakdowns*	2,993	404	618	452	2,743
• *Percentage of restoration within 12 hours*	79.3%	96.5%	95.9%	97.1%	97.01%
3. Supply Reconnection After Disconnection					
• *No. of supply disconnections*	77,350	86,317	80,142	89,166	127,786
• *Bills paid before 1:00 p.m. on disconnection day*	42,681	60,421	48,330	52,393	70,865
• *Percentage of supply reconnection on the same day for bills paid before 1:00 p.m.*	55.2%	70.0%	60.3%	58.8%	55.46%
4. Supply Interruptions which are Planned/Scheduled					
i. Scheduled Interruptions					
• *No. of scheduled interruptions*	618	3,020	4,980	5,020	504
• *Percentage of consumers being given notice within 7 days before interruptions*	66.4%	70.0%	71.0%	81.8%	80.0%
ii. Planning of Scheduled Interruptions					
• *No. of yearly and monthly planning of scheduled interruptions*	320	332	337	339	231
• *No. of affected consumers*	164,790	78,625	6,579	73,901	3,421
• *Percentage of affected consumers informed about the planning of scheduled interruptions*	100.0%	93.8%	99.7%	99.9%	94.01%

Kualiti Perkhidmatan: Prestasi Sabah Electricity Sdn Bhd (SESB)
Quality of Services: Performance of Sabah Electricity Sdn Bhd (SESB)

Details	2007	2008	2009	2010	2011
5. Meter Reading					
• *No. of consumers with estimated readings exceeding 3 consecutive months*	5,525	6,762	5,177	6,843	33,335
• *Percentage of notice given to consumers with estimated readings exceeding 3 consecutive months*	50.0%	50.0%	50.9%	58.4%	55.0%
6. Enquiries/Written Complaints from Consumers					
i. Written Enquiries					
• *No. of written enquiries received*	310	2,695	598	708	432
• *Percentage of reply within 5 working days*	85.5%	80.0%	71.7%	83.3%	81.94%
ii. Enquiries Through Telephone					
• *No. of unresolved complaints made through telephone*	1,682	1,598	2,297	2,744	3,791
• *Percentage of consumers with unresolved complaints recontacted within 24 hours*	8.0%	7.1%	8.4%	13.8%	15.48%
iii. Enquiries at Counter					
• *No. of unresolved complaints made at counter*	1,158	5,009	3,565	2,821	7,220
• *Percentage of consumers with unresolved complaints recontacted within 24 hours*	3.05%	11.6%	5.9%	6.8%	13.80%
7. Service Counter					
• *No. of consumers who were getting services at the counter*	323,427	268,142	246,343	200,888	278,940
• *Percentage of consumers with waiting time not exceeding 15 minutes*	87.0%	75.0%	60.4%	53.5%	52.76%
8. Appointment for Meter Accuracy Check					
• *No. of appointments for meter accuracy check*	2,226	1,425	1,388	1,726	1,502
• *Percentage of meter accuracy check carried out within 2 working days*	49.2%	45.9%	44.8%	45.0%	78.03%
9. Meter Replacement					
• *No. of meter replacements*	4,629	6,446	7,006	8,731	8,997
• *Percentage of meter replacements within 2 working days from the date of application made*	51.03%	51.9%	52.0%	56.1%	61.35%
10. Appointment with Consumers					
i. For Appointments outside SESB Premises					
• *Appointments where SESB officers arrived not later than the agreed time*	90.4%	90.5%	88.8%	84.1%	89.73%
ii. Postponement by SESB					
• *Percentage of subsequent appointment made within 1 working day*	48.9%	61.5%	67.6%	78.3%	71.15%
11. Deposits					
• *No. of consumers found after 6 months that their deposits exceed average consumption of 2 months*	5,797	11,515	18,529	20,206	12,269
• *Percentage of consumers who had the excess deposits returned*	27.9%	11.0%	2.6%	10.5%	10.9%
12. Refund of Consumer Deposits					
• *No. of consumers who had forwarded all required documents for refund of deposits*	6,214	7,675	5,246	7,738	8,258
• *Percentage of consumers who had their deposits refunded within 1 month*	86.3%	80.0%	96.5%	84.5%	85.0%
13. Collection					
• *Percentage of proof of payment sent via mail within 2 working days*	92.3%	93.0%	93.6%	93.9%	95.0%

Kualiti Perkhidmatan: Prestasi Sabah Electricity Sdn Bhd (SESB)
Quality of Services: Performance of Sabah Electricity Sdn Bhd (SESB)

Details	2007	2008	2009	2010	2011
14. Supply Disconnection					
i. With 24 Hours Notice					
• *No. of disconnections due to unsafe consumer installations*	286	613	38	30	32
• *No. of disconnections due to suspicion of electricity theft*	89	90	54	22	102
• *No. of disconnections due to electricity meter being tampered*	10	19	32	15	1
ii. With More Than 24 Hours Notice					
• *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*	25,583	28,578	40,189	58,915	50,028
• *Notice of disconnections due to failure to pay additional deposits within 7 days from notice date*	195	115	254	134	86
iii. Without Any Notice					
• *No. of disconnections due to unsafe installations*	162	258	1,003	1,353	258
15. Special Group of Consumers Facing Difficulties in Order to Pay Electric Bills					
• *No. of handicapped consumers who appealed to avoid disconnections*	0	0	0	7	1
• *No. of senior consumers who appealed to avoid disconnections*	3	12	41	34	10
• *No. of handicapped consumers who were assisted in the payment of bills*	26	25	30	23	5
• *No. of senior consumers who were assisted in the payment of bills*	70	30	16	20	20
16. Voltage Incompliant with the Standards					
i. Not Requiring Enhancement Work on Network					
• *No. of complaints*	815	62	1,130	78	33
• *Percentage of complaints settled within 2 days from the date of complaints*	95.7%	64.5%	38.9%	43.6%	100.0%
ii. Requiring Enhancement Work on Network					
• *No. of complaints*	72	166	118	70	48
• *Percentage of complaints settled within 3 months from the date of complaints*	51.4%	98.2%	68.6%	75.7%	97.92%
17. Reply to New/Increase of Supply Application					
i. No New Substation Required					
• *No. of applications*	2,797	1,897	2,087	2,274	3,248
• *Percentage of applications replied within 1 week from the date of application*	79.0%	72.9%	64.9%	76.2%	79.99%
ii. New Substation Required					
• *No. of applications*	59	114	61	237	242
• *Percentage of applications replied within 2 week from the date of application*	81.4%	86.8%	90.2%	73.4%	96.69%
18. Transferring of Meter Location upon Consumer Request					
• *No. of applications for meter relocation*	23	11	88	16	33
• *Percentage of applications settled within 3 working days*	69.6%	68.8%	62.5%	68.8%	72.73%
19. Education on Energy Efficiency					
• *No. of education programmes on energy efficiency and safety, including activities near installations and electricity lines*	10	11	19	23	6
20. Power Quality Improvement					
• *No. of activities to improve power quality*	581	379	446	454	269

Sumber I *Source*: Sabah Electricity Sdn Bhd

3. Prestasi Pembekalan dan Perkhidmatan Elektrik di Sarawak
Performance of Electricity Supply and Services in Sarawak

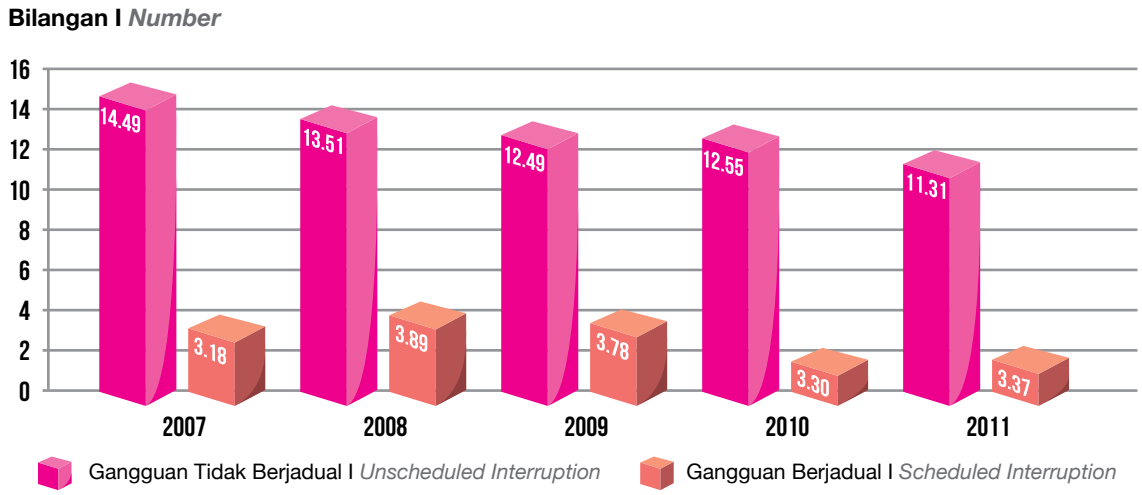
3.1 Sistem Penghantaran Sarawak Energy Berhad (SEB)
Sarawak Energy Berhad (SEB) Transmission System

Jadual A.28: Pelantikan Sistem Penghantaran dengan Kehilangan Beban sebanyak 50 MW dan ke Atas
Table A.28: Monthly Trippings of Transmission System with Load Loss of 50 MW and Above

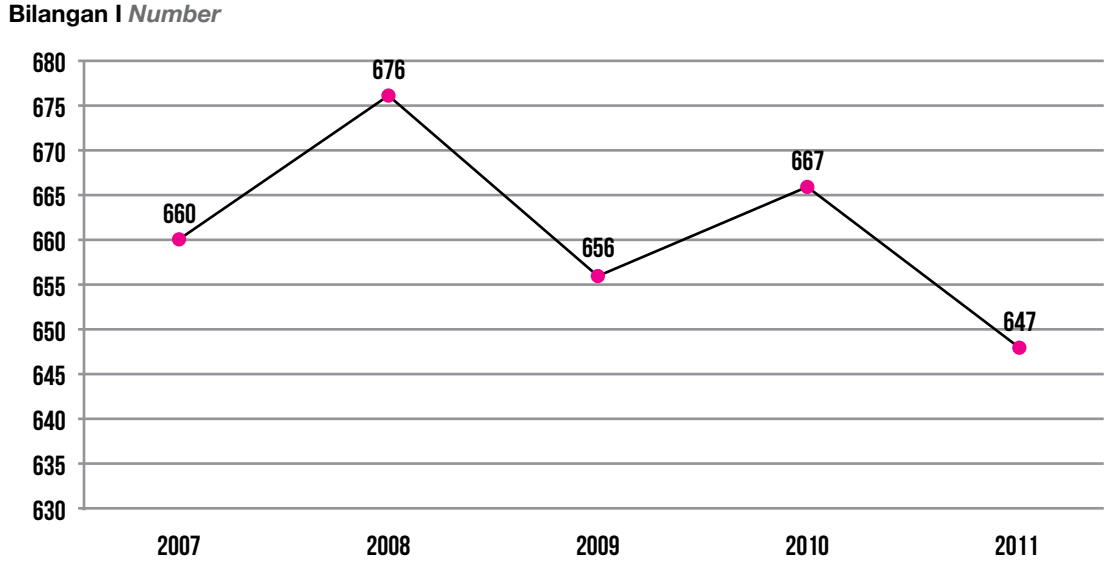
Petunjuk *Indicator*	Jan *Jan*	Feb *Feb*	Mac *Mar*	Apr *Apr*	Mei *May*	Jun *June*	Jul *Jul*	Ogos *Aug*	Sept *Sept*	Okt *Oct*	Nov *Nov*	Dis *Dec*
Bilangan Pelantikan Tanpa Lucutan Beban I *Number of Trippings Without Load Shedding*	1	0	0	1	0	1	1	1	0	2	0	1
Bilangan Pelantikan Dengan Lucutan Beban I *Number of Trippings With Load Shedding*	0	0	0	3	2	2	0	0	0	0	0	0
Kehilangan Beban Maksimum (MW) I *Maximum Load Losses (MW)*	7			40		21	45	27		14		415
Tenaga Yang Tidak Dibekalkan Semasa Pelantikan (MWj) I *Unsupplied Energy During Trippings (MWh)*	2	-	-	12	-	26	19	27	-	7	-	415
Purata Tenaga Tidak Dibekalkan Setiap Pelantikan (MWj) I *Average Unsupplied Energy During Trippings (MWh)*	2	-	-	12	-	26	19	27	-	7	-	415
Purata Tempoh Setiap Pelantikan (Jam: Minit) I *Average Duration Per Tripping (Hour: Minutes)*	0:06	-	-	0:18	-	1:13	1:01	1:39	-	2:39	-	1:49
Tenaga Tidak Dibekalkan Semasa Lucutan Beban (MWj) I *Unsupplied Energy During Load Shedding (MWh)*	-	-	-	60	261	20	-	-	-	-	-	-

3.2 Sistem Pengagihan SEB
SEB Distribution System

Carta A.19: Gangguan Bekalan Elektrik per 1,000 Pengguna
Chart A.19: Electricity Supply Interruptions per 1,000 Consumers



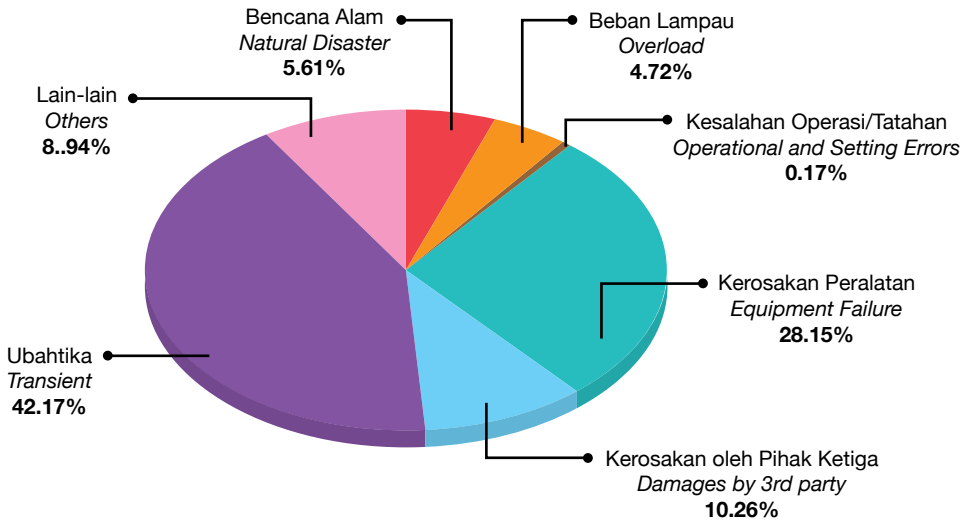
Carta A.20: Purata Gangguan Bekalan Elektrik Bulanan
Chart A.20: Monthly Average Electricity Supply Interruptions



Jadual A.29: Bilangan Gangguan Bekalan Elektrik
Table A.29: Number of Electricity Supply Interruptions

Bilangan | *Number*	2007	2008	2009	2010	2011
Gangguan Tidak Berjadual I *Unscheduled Interruptions*	6,489	6,301	6,040	6,338	5,976
Gangguan Berjadual I *Scheduled Interruptions*	1,426	1,816	1,828	1,665	1,783
Jumlah Gangguan I *Total Interruptions*	**7,915**	**8,117**	**7,868**	**8,003**	**7,759**

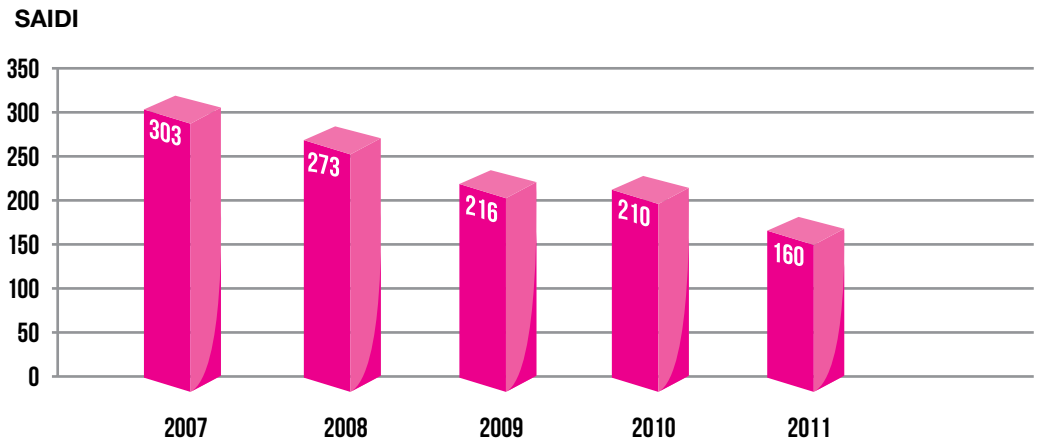
Carta A.21: Peratus Gangguan Bekalan Elektrik Tidak Berjadual mengikut Jenis Gangguan
Chart A.21: Percentage of Unscheduled Supply Interruption by Type of Interruptions



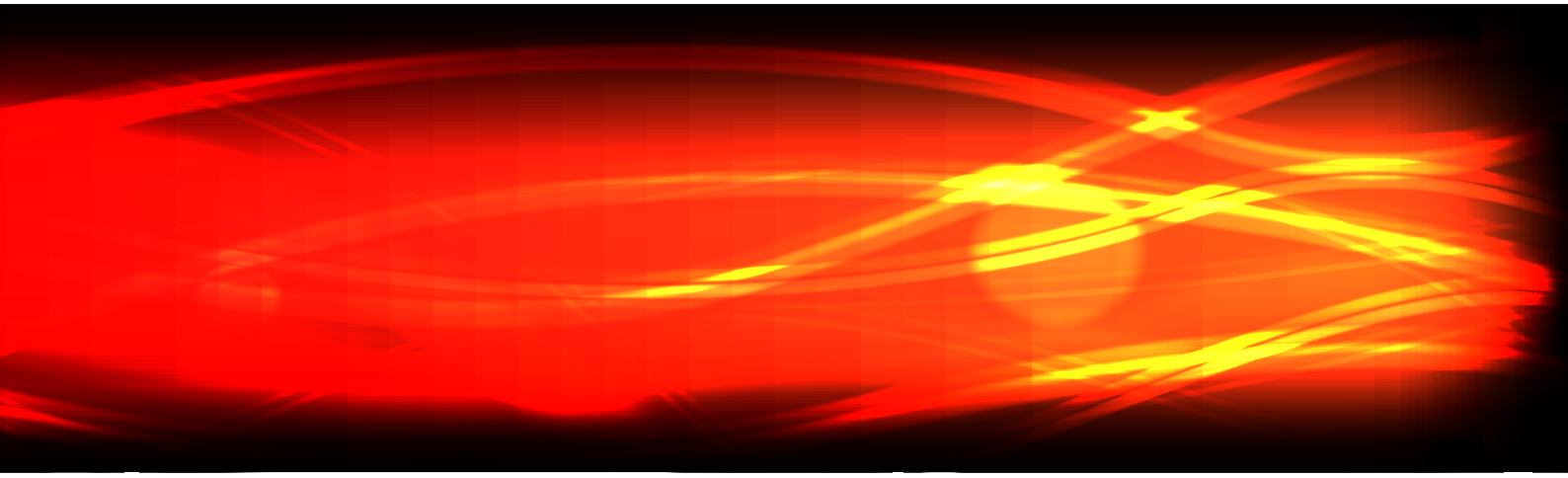
Bilangan Keseluruhan Gangguan Bekalan Elektrik Tidak Berjadual = 5,976
Total Number of Unscheduled Interruptions = 5,976

3.3 SEB: System Average Interruption Duration Index (SAIDI)

Carta A.22: SAIDI (Minit/Pelanggan/Tahun)
Chart A.22: SAIDI (Minutes/Customer/Year)



HARGA ELEKTRIK



ELECTRICITY PRICE

HARGA ELEKTRIK
ELECTRICITY PRICE

1. Tarif Elektrik di Malaysia
Electricity Tariff in Malaysia

Jadual B.1: Tarif Elektrik TNB mengikut Sektor di Semenanjung Malaysia (Berkuatkuasa 1 Jun 2011)
Table B.1: TNB Electricity Tariff by Sector in Peninsular Malaysia (Effective 1st June 2011)

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif A – Tarif Kediaman I *Tariff A – Domestic Tariff*		
200 kWj pertama (1-200 kWj) sebulan I *For the first 200 kWh (1-200 kWh) per month*	sen/kWj I *sen/kWh*	21.80
100 kWj berikutnya (201-300 kWj) sebulan I *For the next 100 kWh (201-300 kWh) per month*	sen/kWj I *sen/kWh*	33.40
100 kWj berikutnya (301-400 kWj) sebulan I *For the next 100 kWh (301-400 kWh) per month*	sen/kWj I *sen/kWh*	40.0
100 kWj berikutnya (401-500 kWj) sebulan I *For the next 100 kWh (401-500 kWh) per month*	sen/kWj I *sen/kWh*	40.20
100 kWj berikutnya (501-600 kWj) sebulan I *For the next 100 kWh (501-600 kWh) per month*	sen/kWj I *sen/kWh*	41.60
100 kWj berikutnya (601-700 kWj) sebulan I *For the next 100 kWh (601-700 kWh) per month*	sen/kWj I *sen/kWh*	42.60
100 kWj berikutnya (701-800 kWj) sebulan I *For the next 100 kWh (701-800 kWh) per month*	sen/kWj I *sen/kWh*	43.70
100 kWj berikutnya (801-900 kWj) sebulan I *For the next 100 kWh (801-900 kWh) per month*	sen/kWj I *sen/kWh*	45.30
Setiap kWj berikutnya (901 kWj ke atas) sebulan *For the next 100 kWh (901 and above) per month*	sen/kWj I *sen/kWh*	45.40
Caj minimum bulanan I *Minimum monthly charge:*	RM	3.00
Tarif B – Tarif Perdagangan Voltan Rendah I *Tariff B – Low Voltage Commercial Tariff*		
Bagi jumlah penggunaan keseluruhan di antara 0-200 kWj sebulan *For overall monthly consumption between 0-200 kWh per month*	sen/kWj I *sen/kWh*	39.30
Bagi jumlah pengunaan keseluruhan melebihi 200 kWj sebulan *For overall monthly consumption more than 200 kWh per month*	sen/kWj I *sen/kWh*	43.0
Caj minimum bulanan I *Minimum monthly charge*	RM	7.20
Tarif C1 – Tarif Perdagangan Am Voltan Sederhana I *Tariff C1 – Medium Voltage General Commercial Tariff*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	25.90
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	31.20
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif C2 – Tarif Perdagangan Puncak/Luar Puncak Voltan Sederhana ***Tariff C2 – Medium Voltage Peak/Off-Peak Commercial Tariff***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	38.60
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	31.20
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	19.20
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00
Tarif D – Tarif Perindustrian Voltan Rendah I *Tariff D – Low Voltage Industrial Tariff*		
Bagi jumlah pengunaan keseluruhan di antara 0-200 kWj sebulan *For overall monthly consumption between 0-200 kWh per month*	sen/kWj I *sen/kWh*	34.50
Bagi jumlah pengunaan keseluruhan melebihi 200 kWj sebulan *For overall monthly consumption more than 200 kWh per month*	sen/kWj I *sen/kWh*	37.70
Tarif Ds – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja) *Tariff Ds – Special Industrial Tariff (only for qualified consumers)*	sen/kWj I *sen/kWh*	35.90
Caj minimum bulanan I *Minimum monthly charge*	RM	7.20
Tarif E1 – Tarif Perindustrian Am Voltan Sederhana I *Tariff E1 – Medium Voltage General Industrial Tariff*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	25.30
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	28.80
Tarif E1s – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja) ***Tariff E1s – Special Industrial Tariff (only for qualified consumers)***		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	19.90
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	28.30
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00
Tarif E2 – Tarif Perindustrian Puncak/Luar Puncak Voltan Sederhana ***Tariff E2 – Medium Voltage Peak/Off-Peak Industrial Tariff***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	31.70
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	30.40
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	18.70

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif E2s – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja) ***Tariff E2s – Special Industrial Tariff (only for qualified consumers)***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	27.70
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	28.30
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	16.10
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00
Tarif E3 – Tarif Perindustrian Puncak/Luar Puncak Voltan Tinggi I *Tariff E3 – High Voltage Peak/Off-Peak Industrial Tariff*		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	30.40
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	28.80
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	RM	17.30
Tarif E3s – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja) ***Tariff E3s – Special Industrial Tariff (only for qualified consumers)***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	24.40
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	26.70
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	14.70
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00
Tarif F – Tarif Perlombongan Voltan Rendah I *Tariff F – Low Voltage Mining Tariff*		
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	32.60
Caj minimum bulanan I *Minimum monthly charge*	RM	120.00
Tarif F1 – Tarif Perlombongan Am Voltan Sederhana I *Tariff F1 – Medium Voltage General Mining Tariff*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	18.10
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	26.80
Caj minimum bulanan I *Minimum monthly charge*	RM	120.00
Tarif F2 – Tarif Perlombongan Puncak/Luar Puncak Voltan Sederhana ***Tariff F2 – Medium Voltage Peak/Off-Peak Mining Tariff***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM	25.50
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	26.80
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	14.70
Caj minimum bulanan I *Minimum monthly charge*	RM	120.00

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif G – Tarif Lampu Jalanraya I *Tariff G – Street Lighting Tariff*		
Bagi semua kWj (termasuk senggaraan) I *For all kWh (including maintenance)*	sen/kWj I *sen/kWh*	26.10
Bagi semua kWj (tidak termasuk senggaraan) I *For all kWh (excluding maintenance)*	sen/kWj I *sen/kWh*	16.40
Caj minimum bulanan I *Minimum monthly charge*	RM	7.20
Tarif G1 – Tarif Lampu Neon & Lampu Limpah I *Tariff G1 – Neon & Floodlight Tariff*		
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	17.80
Caj minimum bulanan I *Minimum monthly charge*	RM	7.20
Tarif H - Tarif Pertanian Spesifik Voltan Rendah I *Tariff H – Low Voltage Specific Agriculture Tariff*		
Bagi jumlah pengunaan keseluruhan di antara 0-200 kWj sebulan *For overall monthly consumption between 0-200 kWh per month*	sen/kWj I *sen/kWh*	36.90
Bagi jumlah pengunaan keseluruhan melebihi 200 kWj sebulan *For overall monthly consumption more than 200 kWh per month*	sen/kWj I *sen/kWh*	40.30
Caj minimum bulanan I *Minimum monthly charge*	RM	7.20
Tarif H1 – Tarif Pertanian Spesifik Am Voltan Sederhana I *Tariff H1 – Medium Voltage General Specific Agriculture Tariff*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	25.90
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	30.0
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00
Tarif H2 – Tarif Pertanian Spesifik Puncak/Luar Puncak Voltan Sederhana ***Tarif H2 - Medium Voltage Peak/Off-Peak Specific Agriculture Tariff***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	34.90
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	31.20
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	19.20
Caj minimum bulanan I *Minimum monthly charge*	RM	600.00

Nota I *Note*:
Berkuatkuasa mulai 1 September 2011, sumbangan 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 from the 1st of September 2011, 1% Feed-in Tariff (FiT) contribution for Renewable Energy Resources Fund (RE) is imposed on consumers electricity monthly bill (except for domestic consumers not exceeding 300 kWh per month)

Jadual B.2: Tarif Elektrik TNB untuk 'Top-Up' dan caj 'Standby' untuk *Co-Generators* (Berkuatkuasa 1 Jun 2011)
Table B.2: TNB Electricity Tariff for 'Top-Up' and 'Standby' Charges for Co-Generators (Effective 1st June 2011)

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*	
		Top-up	*Standby*
Tarif C1 – Tarif Perdagangan Am Voltan Sederhana I *Tariff C1 – Medium Voltage General Commercial Tariff*			
Caj kehendak maksimum sebulan I *Maximum demand charge per month*	RM/kW	25.90	14.00
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	31.20	
Tarif C2 – Perdagangan Puncak/Luar Puncak Voltan Sederhana *Tariff C2 – Medium Voltage Peak/Off-Peak Commercial Tariff*			
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	38.60	14.00
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	31.20	
Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	19.20	
Tarif E1 – Perindustrian Am Voltan Sederhana I *Tariff E1 – Medium Voltage General Industrial Tariff*			
Caj kehendak maksimum sebulan I *Maximum demand charge per month*	RM/kW	25.30	14.00
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	28.80	
Tarif E2 – Perindustrian Puncak/Luar Puncak Voltan Sederhana I *Tariff E2 – Medium Voltage Peak/Off-Peak Industrial Tariff*			
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	31.70	14.00
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	30.40	
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	18.70	

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*	
		Top-up	*Standby*
Tarif E3 – Perindustrian Puncak/Luar Puncak Voltan Tinggi I *Tariff E3 – High Voltage Peak/Off-Peak Industrial Tariff*			
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	30.40	12.00
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	28.80	
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	17.30	
Tarif F1 – Perlombongan Am Voltan Sederhana I *Tariff F1 - Medium Voltage General Mining Tariff*			
Caj kehendak maksimum sebulan I *Maximum demand charge per month*	RM/kW	18.10	14.00
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	26.80	
Tarif F2 – Perlombongan Puncak/Luar Puncak Voltan Sederhana I *Tariff F2 – Medium Voltage Peak/Off-Peak Mining Tariff*			
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	25.50	14.00
Bagi semua kWj dalam tempoh puncak I *For all kWh during the peak period*	sen/kWj I *sen/kWh*	26.80	
Bagi semua kWj dalam tempoh luar puncak I *For all kWh during the off-peak period*	sen/kWj I *sen/kWh*	14.70	

Nota I *Note*:

1. Kadar *Standby* baru (bermula 1 Jun 2011) akan digunapakai oleh pengguna-pengguna berikut I *This new Standby rate (as of 1st June 2011) is applicable to the following customers:-*
   - Kesemua pengguna *co-generation* I *All new co-generation customers*
   - Pengguna *co-generation* sedia ada yang ingin bertukar kepada kadar *Standby* yang baru I *Existing co-generation customers who wish to migrate to this new Standby rate.*
2. 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) I *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 1st June 2011)*

Jadual B.3: Tarif Elektrik SESB mengikut Sektor di Sabah dan Wilayah Persekutuan Labuan (Berkuatkuasa 15 Julai 2011)

Table B.3: SESB Electricity Tariff by Sector in Sabah and Federal Territory of Labuan (Effective 15th July 2011)

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif DM – Tarif Kediaman I *Tariff DM - Domestic Tariff*		
100 kWj pertama (1-100 kWj) sebulan I *For the first 100 kWh (1-100 kWh) per month*	sen/kWj I *sen/kWh*	17.50
100 kWj berikutnya (101-200 kWj) sebulan I *For the next 100 kWh (101-200 kWh) per month*	sen/kWj I *sen/kWh*	18.50
300 kWj berikutnya (201-500 kWj) sebulan I *For the next 300 kWh (201-500 kWh) per month*	sen/kWj I *sen/kWh*	33.0
Setiap kWj berikutnya (501 kWj ke atas) sebulan I *For the next kWh (501 onwards) per month*	sen/kWj I *sen/kWh*	34.50
Caj minimum bulanan I *Minimum monthly charge*	RM	5.00
Tarif CM1 – Tarif Perdagangan Voltan Rendah I *Tariff CM1 – Low Voltage Commercial Tariff*		
200 kWj pertama (1-200 kWj) sebulan I *For the first 200 kWh (1-200 kWh) per month*	sen/kWj I *sen/kWh*	33.0
Setiap kWj berikutnya (201 kWj ke atas) sebulan *For the next kWh (201 kWh onwards) per month*	sen/kWj I *sen/kWh*	33.50
Caj minimum bulanan I *Minimum monthly charge*	RM	15.00
Tarif CM2 – Tarif Perdagangan Am Voltan Sederhana I *Tariff CM2 – Medium Voltage General Commercial Tarif*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	18.50
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	28.0
Caj minimum bulanan I *Minimum monthly charge*	RM	1,000.00
Tarif CM3 – Tarif Perdagangan Puncak/Luar Puncak Voltan Sederhana ***Tariff CM3 – Medium Voltage Peak/Off-Peak Commercial***		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	24.00
Bagi semua kWj dalam tempoh puncak I *All units during the peak period*	sen/kWj I *sen/kWh*	28.80
Bagi semua kWj dalam tempoh luar puncak I *All units during the off-peak period*	sen/kWj I *sen/kWh*	17.60
Caj minimum bulanan I *Minimum monthly charge*	RM	1,000.00

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif ID1 – Tarif Perindustrian Voltan Rendah I *Tariff ID1 – Low Voltage Industrial Tariff*		
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	32.0
Caj minimum bulanan I *Minimum monthly charge*	RM	15.00
Tarif ID2 – Tarif Perindustrian Am Voltan Sederhana I *Tariff ID2 – Medium Voltage General Industrial*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	18.50
Bagi semua kWj I *For all kWh*	sen/kWj I *sen/kWh*	22.80
Caj minimum bulanan I *Minimum monthly charge*	RM	1,000.00
Tarif ID3 – Tarif Perindustrian Puncak/Luar Puncak Voltan Sederhana I *Tariff ID3 – Medium Voltage Peak/Off-Peak Industrial*		
Bagi setiap kilowatt kehendak maksimum sebulan dalam tempoh puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	21.40
Bagi semua kWj dalam tempoh puncak I *All units during the peak period*	sen/kWj I *sen/kWh*	26.50
Bagi semua kWj dalam tempoh luar puncak I *All units during the off-peak period*	sen/kWj I *sen/kWh*	15.60
Caj minimum bulanan I *Minimum monthly charge*	RM	1,000.00
Tarif PL – Tarif Lampu Jalanraya I *Tariff PL – Public Lighting*		
Bagi semua kWj (tidak termasuk senggaraan) I *For all kWh (excluding maintenance)*	sen/kWj I *sen/kWh*	16.00
Bagi semua kWj (termasuk senggaraan) I *For all kWh (including maintenance)*	sen/kWj I *sen/kWh*	31.00
Caj minimum bulanan I *Minimum monthly charge*	RM	15.00

Jadual B.4: Tarif Elektrik SEB mengikut Sektor di Sarawak (Berkuatkuasa 1 April 2007)
Table B.4: SEB Electricity Tariff by Sector in Sarawak (Effective 1st April 2007)

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif C1 – Perdagangan I *Tariff C1 - Commercial*		
Bagi 100 unit pertama sebulan I *For the first 100 units per month*	sen/kWj I *sen/kWh*	40
Bagi 490 unit berikutnya sebulan I *For the next 490 units per month*	sen/kWj I *sen/kWh*	34
Bagi setiap unit tambahan sebulan I *For each additional unit per month*	sen/kWj I *sen/kWh*	30
Caj minimum bulanan I *Minimum monthly charge*	RM	10.00
Tarif C2 – Kehendak Perdagangan I *Tariff C2 – Commercial Demand*		
Bagi setiap kilowatt kehendak maksimum bulanan *For each kilowatt of maximum demand per month*	RM/kW	16.00
Bagi setiap unit I *For each unit*	sen/kWj I *sen/kWh*	25
Caj minimum bulanan I *Minimum monthly charge* (per kW X Kehendak Bayaran Dikenakan I *Billing Demand)*	RM	16.00
Tarif C3 – Kehendak Waktu Puncak/Waktu Bukan Puncak I *Tariff C3 – Commercial Peak/Off-Peak Demand*		
Bagi setiap kilowatt kehendak maksimum sebulan dalam waktu puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	20.00
Bagi setiap unit waktu puncak I *For each unit during the peak period*	sen/kWj I *sen/kWh*	25
Bagi setiap unit waktu bukan puncak I *For each unit during the off-peak period*	sen/kWj I *sen/kWh*	14.40
Caj minimum bulanan I *Minimum monthly charge* (per kW X Kehendak Bayaran Dikenakan I *Billing Demand*)	RM	20.00
Tarif D – Domestik I *Tariff D – Domestic*		
Bagi 100 unit pertama sebulan I *For the first 100 units per month*	sen/kWj I *sen/kWh*	34
Bagi 300 unit berikutnya sebulan I *For the next 300 units per month*	sen/kWj I *sen/kWh*	29
Bagi setiap unit tambahan sebulan I *For each additional unit per month*	sen/kWj I *sen/kWh*	33
Caj minimum bulanan I *Minimum monthly charge* (per kW X Kehendak Bayaran Dikenakan I *Billing Demand*)	RM	5.00
Tarif I1 – Perindustrian I *Tariff I1 – Industrial*		
Bagi 100 unit pertama sebulan I *For the first 100 units per month*	sen/kWj I *sen/kWh*	40
Bagi 2900 unit berikutnya sebulan I *For the next 2900 units per month*	sen/kWj I *sen/kWh*	30
Bagi setiap unit tambahan sebulan I *For each additional unit per month*	sen/kWj I *sen/kWh*	27
Caj minimum bulanan I *Minimum monthly charge* (per kW X Kehendak Bayaran Dikenakan I *Billing Demand*)	RM	10.00

Kategori Tarif I *Tariff Category*	Unit	Kadar I *Rates*
Tarif I2 – Kehendak Perindustrian I *Tariff I2 – Industrial Demand*		
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	16.00
Bagi setiap unit I *For each unit*	sen/kWj I *sen/kWh*	22.20
Caj minimum bulanan I *Minimum monthly charge* (per kW X Kehendak Bayaran Dikenakan I *Billing Demand*)	RM	16.00
Tarif I3 – Kehendak Waktu Puncak/Waktu Bukan Puncak Perindustrian I *Tariff I3 – Industrial Peak/Off-Peak Demand*		
Bagi setiap kilowatt kehendak maksimum sebulan dalam waktu puncak *For each kilowatt of maximum demand per month during the peak period*	RM/kW	20.00
Bagi setiap unit waktu puncak I *For each unit during the peak period*	sen/kWj I *sen/kWh*	23.40
Bagi setiap unit bukan puncak I *For each unit during the off-peak period*	sen/kWj I *sen/kWh*	14.40
Caj minimum bulanan I *Minimum monthly charge* (per kW X Kehendak Bayaran Dikenakan I *Billing Demand*)	RM	20.00
Tarif PL – Lampu Awam I *Tariff PL – Public Lighting*		
Bagi setiap unit I *For each unit*	sen/kWj I *sen/kWh*	47
Caj minimum bulanan I *Minimum monthly charge*	RM	10.00

2. Purata Harga Jualan
Average Selling Price

Jadual B.5: Perbandingan Purata Harga Jualan (sen/kWj) dengan Syarikat Utiliti Kuasa yang Terpilih
Table B.5: Comparison of Electricity Average Selling Price (sen/kWh) among Selected Power Utility Companies

Syarikat Utiliti Kuasa Terpilih *Power Utility Companies*	Domestik (sen/kWj) *Domestic (sen/kWh)*	Komersial (sen/kWj) *Commercial (sen/kWh)*	Perindustrian (sen/kWj) *Industry (sen/kWh)*	Lampu Awam (sen/kWj) *Public Lighting (sen/kWh)*	Pertanian (sen/kWj) *Agriculture (sen/kWh)*	Jumlah (sen/kWj) *Total (sen/kWh)*
TNB	27.61	38.19	28.94	20.49	37.24	31.72
SESB	24.70	29.05	23.77	28.38	-	26.2
SEB	31.17	31.19	24.66	47.09	-	29.41
PLN, Indonesia	21.06	32.41	23.70	26.97	n/a	24.34
Taipower, Taiwan	30.07	35.93	25.67	12.53	-	28.36
MEA, Thailand	37.76	n/a	n/a	n/a	n/a	35.94
CLP, Hong Kong	n/a	n/a	n/a	n/a	n/a	39.72
Meralco, Philippines	81.43	72.01	57.26	8.54	n/a	70.40
TEPCO, Japan	86.61	n/a	n/a	n/a	n/a	87.55
KEPCO, Korea	33.44	28.35	22.66	24.31	12.07	24.91
Singapore Power	57.50	52.62	49.75	n/a	n/a	56.89

3. Kos-Kos Penjanaan
Generation Costs

Jadual B.6: Kos Penjanaan (sen/kWj) TNB
Table B.6: Generation Cost (sen/kWh) of TNB

Kos Penjanaan (sen/kWj) I *Generation Cost (sen/kWh)*	2007	2008	2009	2010	2011
(a) Penjanaan Sendiri I *Own Generation*	8.18	13.22	17.65	16.16	18.22
(b) Tenaga Dibeli I *Energy Purchased*	15.3	17.5	23.01	21.99	24.68
(c) Kos Keseluruhan I *Overall Cost - (a) & (b)*	13.4	16.29	21.58	20.42	23.08

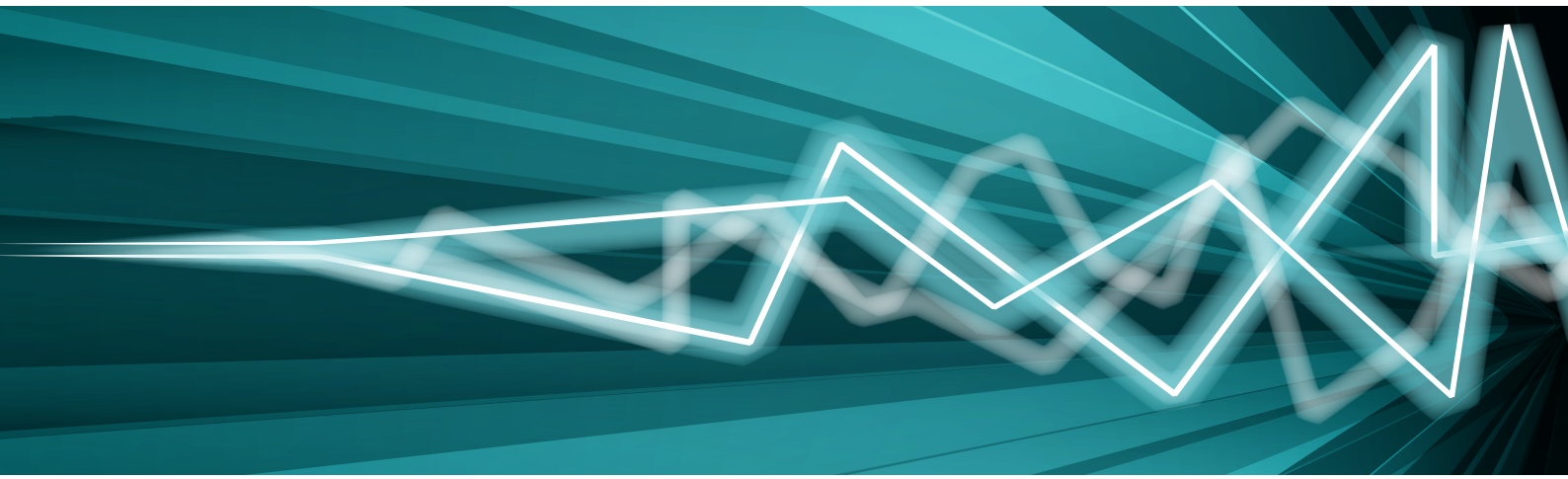
Jadual B.7: Kos Penjanaan (sen/kWj) SESB
Table B.7: Generation Cost (sen/kWh) of SESB

Kos Penjanaan (sen/kWj) I *Generation Cost (sen/kWh)*	2007	2008	2009	2010	2011
(a) Penjanaan Sendiri I *Own Generation*	12.2	12.8	15.23	17.42	24.3
(b) Tenaga Dibeli I *Energy Purchased*	20.6	17.8	16.44	22.33	25.8
(c) Kos Keseluruhan I *Overall Cost - (a) & (b)*	17.00	16.00	16.15	21.21	25.2

Jadual B.8: Kos Penjanaan (sen/kWj) SEB
Table B.8: Generation Cost (sen/kWh) of SEB

Kos Penjanaan (sen/kWj) I *Generation Cost (sen/kWh)*	2007	2008	2009	2010	2011
(a) Penjanaan Sendiri I *Own Generation*	14.9	19.2	15.6	14.6	21.8
(b) Tenaga Dibeli I *Energy Purchased*	12.5	13.6	15.4	14.2	13.2
(c) Kos Keseluruhan I *Overall Cost - (a) & (b)*	13.6	16.2	15.5	14.3	15.4*

Nota I *Note*:
* Pada tahun 2011, Kos Penjanaan di Sarawak mengambil kira kos-kos penjanaan bagi Sejingkat Power Corporation, Sarawak Power Corporation, PPLS Power Generation, dan Mukah Power Generation
In 2011, Generation Cost in Sarawak includes generation cost for Sejingkat Power Corporation, Sarawak Power Corporation, PPLS Power Generation, and Mukah Power Generation



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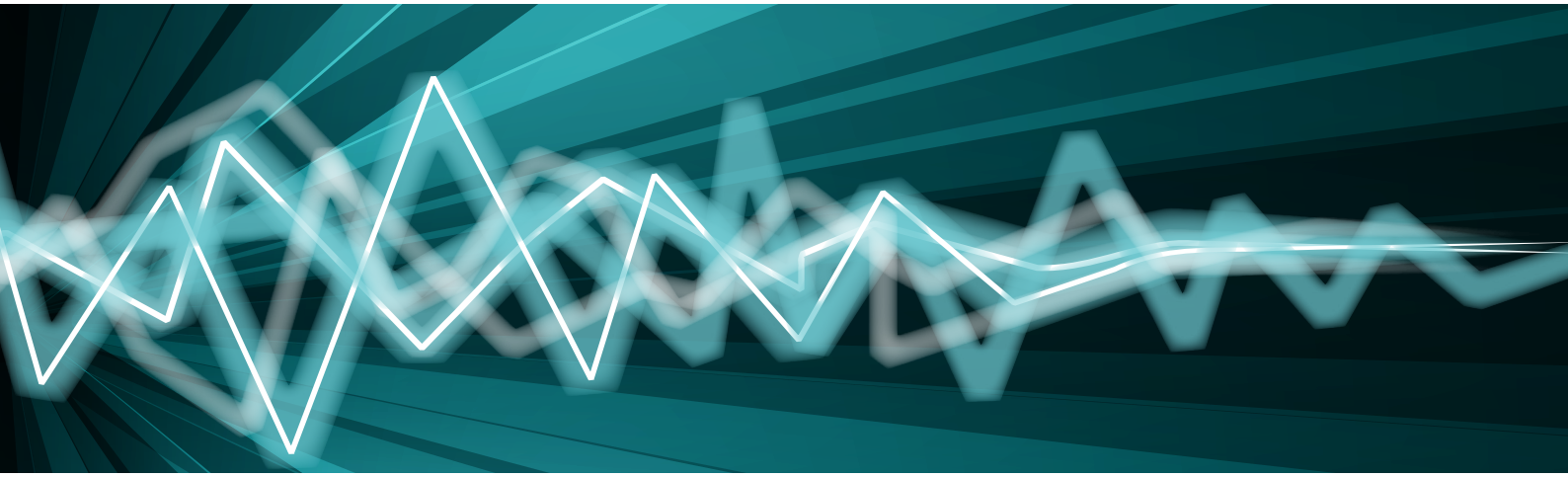

INDUSTRY INFORMATION & STATISTICS

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INDUSTRY INFORMATION & STATISTICS

1. Maklumat dan Statistik Industri di Semenanjung Malaysia
Industry Information and Statistics in Peninsular Malaysia

1.1 Statistik Tenaga Nasional Berhad (TNB)
Statistics of Tenaga Nasional Berhad (TNB)

Jadual C.1: Sorotan Prestasi
Table C.1: Performance Highlights

Petunjuk I *Indicator*	2007	2008	2009	2010	2011
Kehendak Maksimum (MW) I *Maximum Demand (MW)*	13,620	14,007	14,245	15,072	15,476
Jumlah Unit Penjanaan (GWj) I *Total Units Generated (GWh)*[1]	25,388	27,691	29,608	27,689	24,018
Jumlah Unit Jualan (GWj) I *Total Units Sold (GWh)*	82,052	85,616	82,443	89,621	93,713
Hasil Jualan Elektrik (RM Juta) I *Sales of Electricity (RM Million)*	20,696	22,555	26,388	28,020	29,273
Kapasiti Penjanaan Terpasang (MW) I *Installed Generation Capacity (MW)*[2]	6,346	6,365	7,040	7,040	7,054
Jumlah Kakitangan I *Number of Employees*[3]	24,950	24,927	24,613	25,571	26,732
Hasil Jualan Setiap Kakitangan (RM Juta/Kakitangan) *Sales of Electricity per Employee (RM Million/Employee)*	0.83	0.90	1.07	1.10	1.10
Unit Jualan Setiap Kakitangan (GWj/Kakitangan) *Units Sold per Employee (GWh/Kakitangan)*	3.29	3.43	3.35	3.50	3.50
Kapasiti Penjanaan Setiap Kakitangan (MW/Kakitangan) *Installed Capacity per Employee (MW/Employee)*	0.25	0.26	0.29	0.28	0.26
Jumlah Unit Pembelian (GWj) I *Total Units Purchased (GWh)*	67,225	68,091	63,156	73,830	76,887
Jumlah Unit Eksport (GWj) I *Total Units Exported (GWh)*	2,477	1,152	166	88	73
Jumlah Unit Import (GWj) I *Total Units Imported (GWh)*	2.4	0.11	0.06	0.03	224.88

Jadual C.2: Kapasiti Penjanaan Terpasang (MW) dan Kebolehdapatan Keseluruhan (%)
Table C.2: Installed Generation Capacity (MW) and Overall Availability (%)

Jenis Bahan Api I *Fuel Type*	2007	2008	2009	2010	2011
Hidro I *Hydro*	1,911	1,911	1,911	1,911	1,911
Gas Asli I *Natural Gas*	4,367	4,386	5,061	5,061	5,075
Arang batu I *Coal*	-	-	-	-	-
Minyak I *Medium Fuel Oil (MFO)*	-	-	-	-	-
Disel I *Diesel*	68	68	68	68	68
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*	6,346	6,365	7,040	7,040	7,054
Kebolehdapatan Keseluruhan (%) I *Overall Availability (%)*	91.0	90.0	91.0	89.4	86.8

Jadual C.3: Campuran Penjanaan (GWj)
Table C.3: Generation Mix (GWh)

Jenis Bahan Api I *Fuel Type*	2007	2008	2009	2010	2011
Hidro I *Hydro*	4,879	6,669	5,916	5,227	5,950
Gas Asli I *Natural Gas*	20,473	20,979	23,658	22,337	15,915
Arang batu I *Coal*	-	-	-	-	-
Minyak I *Medium Fuel Oil (MFO)*	-	-	-	6	686
Disel I *Diesel*	35.8	43	34	119	1,468
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*	25,388	27,691	29,608	27,689	24,018

Nota I *Note:*
1 Tidak termasuk IPP di Semenanjung Malaysia I *Excluding IPPs in Peninsular Malaysia*
2 Tidak termasuk IPP di Semenanjung Malaysia I *Excluding IPPs in Peninsular Malaysia*
3 *Tidak termasuk kakitangan anak syarikat milik penuh TNB dan anak syarikat dengan pegangan saham terbesar I Excluding TNB wholly owned subsidiaries and TNB majority owned subsidiaries*

Jadual C.4: Jualan Tenaga Elektrik (GWj)
Table C.4: Sales of Electricity (GWh)

Sektor I *Sector*	2007	2008	2009	2010	2011
Domestik I *Domestic*	15,048	15,810	16,792	18,217	18,916
Komersil I *Commercial*	25,123	26,939	27,859	29,872	31,755
Industri I *Industry*	38,320	40,511	36,261	40,071	41,449
Lampu Awam I *Public Lighting*	884	956	1,078	1,046	1,139
Perlombongan I *Mining*	34	34	47	62	75
Eksport (EGAT) I *Export* (EGAT)	2,477	1,152	166	88	73
Lain-lain (Pertanian) I *Others (Agriculture)*	166	214	240	265	306
Jumlah I *Total*[4]	82,052	85,616	82,443	89,621	93,713

Jadual C.5: Bilangan Pengguna
Table C.5: Number of Consumers

Sektor I *Sector*	2007	2008	2009	2010	2011
Domestik I *Domestic*	5,563,951	5,750,325	5,938,095	6,128,224	6,288,281
Komersil I *Commercial*	1,056,954	1,110,718	1,164,959	1,224,414	1,281,108
Industri I *Industry*	24,929	25,330	25,663	25,580	26,203
Lampu Awam I *Public Lighting*	41,796	45,037	47,715	50,122	53,075
Perlombongan I *Mining*	14	13	15	17	20
Lain-lain (Pertanian) I *Others (Agriculture)*	782	906	996	1,080	1,166
Unit Percuma I *Free Units*[5]	-	-	-	2,218	2,264
Jumlah I *Total*	6,688,426	6,932,329	7,177,443	7,431,655	7,652,117

Jadual C.6: Keupayaan Sistem Penghantaran
Table C.6: Transmission System Capacity

Talian/Kabel Sistem Penghantaran *Transmission System Lines/Cables*	2007	2008	2009	2010	2011
500 kV (km)	[6]890	[6]890	[7]1,209	[8]1,094	[8]1,094
275 kV (km)	6,737	7,616	7,738	8,028	8,428
132 kV (km)	11,009	11,299	11,308	11,415	11,672
66 kV (km)[9]	68.7	-	-	0.9	-
Pencawang Penghantaran I *Transmission Substations*					
Bilangan I *Number*	441	386	385	392	399
Keupayaan I *Capacity* (MVA)	76,223	83,808	82,990	86,030	94,325
Prestasi I *Performance*					
Bilangan Kejadian Pelantikan I *Number of Tripping Incidents*	66	392	333	322	305
Tenaga yang Tidak Dibekal (MWj) I *Unsupplied Energy (MWh)*	2,121	1,532	242	215	261

Nota I *Note:*
4 Jualan Tenaga Elektrik bagi TNB termasuk pembelian dari IPP di Semenanjung Malaysia I *Sales of Electricity for TNB includes the energy purchases from IPPs in Peninsular Malaysia*
5 Unit Percuma merujuk kepada bekalan elektrik yang telah diberikan tanpa dikenakan bayaran bil bulanan. Premis yang layak ialah premis-premis TNB termasuk bangunan pejabat, rumah kelab, kuarters, pencawang masuk utama, pencawang pembahagian utama dan pencawang elektrik I *Free Units refers to electricity that has been given 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*
6 Sepanjang 440 km talian penghantaran 500 kV dikendalikan pada voltan 275 kV I *440 km of transmission lines were operated at 275 kV*
7 Sepanjang 541 km talian penghantaran 500 kV dikendalikan pada voltan 275 kV I *541 km of transmission lines were operated at 275 kV*
8 Sepanjang 425.92 km talian penghantaran 500 kV dikendalikan pada voltan 275 kV I *425.92 km of transmission lines were operated at 275 kV*
9 Talian 66 kV yang berjumlah 0.9 km telah pun dihentitugas pada 16 September 2011 I *66kV lines amounting to 0.9 km has been terminated on 16 September 2011*

Jadual C.7: Keupayaan Sistem Pengagihan
Table C.7: Distribution System Capacity

Talian/Kabel Sistem Pengagihan ***Distribution System Lines/Cables***	**2007**	**2008**	**2009**	**2010**	**2011**
Talian Atas I *Overhead Lines (km)*	161,080	191,714	341,318	475,972	477,191
Kabel Bawah Tanah I *Underground Cables (km)*	343,665	357,267	361,763	376,226	379,661
Pencawang Pengagihan I *Distribution Substations*					
Bilangan I *Number*	58,905	61,238	62,852	63,341	65,556
Keupayaan I *Capacity (MVA)*	48,961	66,696	68,454	69,456	125,222
Prestasi I *Performance*					
Bilangan Gangguan Bekalan I *Number of Supply Interruptions*[10]	54,479	103,876	126,566	110,633	90,979

Nota I *Note:*
10 Angka ini meliputi pengguna tunggal yang mengalami gangguan melebihi 1 minit I *This figure includes single consumers with duration of interruptions of more than 1 minute*

1.2 Penjana Kuasa Bebas (IPP)
Independent Power Producers (IPPs)

Jadual C.8: Kapasiti Berlesen (MW), Unit Penjanaan dan Jualan (GWj)
Table C.8: Licensed Capacity (MW), Units Generated and Sold (GWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Jenis Loji *Plant Type*	Kapasiti Berlesen *Licensed Capacity (MW)*	Unit Penjanaan (GWj) *Units Generated (GWh)*	Unit Jualan (GWj) *Units Sold (GWh)*
1	YTL Power Generation Sdn. Bhd.			7,610	7,476
	Paka, Terengganu	Kitar Padu *Combined Cycle*	780.0		
	Pasir Gudang, Johor		390.0		
2	Genting Sanyen Power Sdn. Bhd. Kuala Langat, Selangor	Kitar Padu *Combined Cycle*	762.0	3,999	3,908
3	Segari Energy Ventures Sdn. Bhd. Manjung, Perak	Kitar Padu *Combined Cycle*	1,303.0	2,612	2,589
4	Powertek Bhd. Alor Gajah, Melaka	Turbin Gas *Gas Turbines*	440.0	22	22
5	Port Dickson Power Bhd. Port Dickson, Negeri Sembilan	Turbin Gas *Gas Turbines*	440.0	35	35
6	Musteq Hydro Sdn. Bhd. Sg. Kenerong, Kelantan	Hidro *Hydro*	20.0	108	108
7	TNB Janamanjung Sdn. Bhd.[1] Manjung, Perak	Arang Batu *Coal*	2,100.0	13,510	12,460
8	Teknologi Tenaga Perlis Consortium Sdn. Bhd. Kuala Sungai Baru, Perlis	Kitar Padu *Combined Cycle*	650.0	4,674	4,603
9	Nur Generation Sdn. Bhd. Kulim High-Tech Industrial Park, Kedah	Kitar Padu *Combined Cycle*	440.0	1,286	1,263
10	Pahlawan Power Sdn. Bhd. Melaka Tengah, Melaka	Kitar Padu *Combined Cycle*	334.0	1,646	1,616
11	Prai Power Sdn. Bhd. Seberang Perai Tengah, Pulau Pinang	Kitar Padu *Combined Cycle*	350.0	2,121	2,071
12	GB3 Sdn. Bhd. Manjung, Perak	Kitar Padu *Combined Cycle*	640.0	3,193	3,048
13	Panglima Power Sdn. Bhd. Alor Gajah, Melaka	Kitar Padu *Combined Cycle*	720.0	3,884	3,794
14	Tanjung Bin Power Sdn. Bhd. Pontian, Johor	Arang Batu *Coal*	2,100.0	13,748	13,086
15	Kapar Energy Ventures Sdn. Bhd. Klang, Selangor	Minyak / Gas *Oil /Gas*	2,420.0	14,282	12,987
		Arang Batu *Coal*			
		Turbin Gas *Gas Turbines*			
16	Jimah Energy Ventures Sdn. Bhd. Port Dickson, Negeri Sembilan	Arang Batu *Coal*	1,400	10,924	10,325

Nota I *Note:*
1 Anak Syarikat TNB I *TNB Subsidiary*

1.3 Projek Janakuasa Kecil Sumber Tenaga yang Boleh Baharu (SREP)
Small Renewable Energy Power (SREP) Projects

Jadual C.9: Kapasiti Berlesen (MW), Unit Penjanaan dan Jualan (MWj)
Table C.9: Licensed Capacity (MW), Units Generated and Sold (MWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Jenis Loji *Plant Type*	Penggerak Primer/ Jenis Bahan Api *Prime Mover/ Fuel Type*	Kapasiti Berlesen *Licensed Capacity (MW)*	Unit Penjanaan (MWj) *Units Generated (MWh)*	Unit Jualan (MWj) *Units Sold (MWh)*
1	Jana Landfill Sdn. Bhd. Seri Kembangan, Selangor	Turbin Gas *Gas Turbines*	Gas Landfill *Landfill Gas*	2.0	5,613	5,613
2	Recycle Energy Sdn. Bhd. Kajang, Selangor	Turbin Stim *Steam Turbines*	Sampah Yang Telah Diproses *Refuse Derived Fuel*	8.9	n/a	n/a
3	MHES Asia Sdn. Bhd.[2] Jempol, Negeri Sembilan	Turbin Stim *Steam Turbines*	Sisa Sawit *Palm Waste*	13.0	-	-
4	Sunquest Sdn. Bhd.[3] Port Dickson, Negeri Sembilan	Turbin Stim *Steam Turbines*	Sisa Sawit *Palm Waste*	6.5	-	-
5	Amcorp Perting Hydro Sdn. Bhd. Bentong, Pahang	Mini Hidro *Mini Hydro*	Air *Water*	4.2	22,739	22,739
6	I.S. Energy Sdn. Bhd.[3] Kuala Krai, Kelantan	Mini Hidro *Mini Hydro*	Air *Water*	2.8	-	-
7	Renewable Power Sdn. Bhd. Hulu Selangor, Selangor	Mini Hidro *Mini Hydro*	Air *Water*	2.2	6,211	5,964
8	Bell Eco Power Sdn. Bhd. Batu Pahat, Johor	Turbin Gas *Gas Turbines*	*Palm Oil Mill Effluent (POME)*	2.0	2,030	1,399
9	Achi Jaya Plantations Sdn. Bhd. Segamat, Johor	Turbin Gas *Gas Turbines*	*Palm Oil Mill Effluent (POME)*	1.3	n/a	n/a
10	Pesaka Technologies Sdn. Bhd.[3] Gua Musang, Kelantan	Mini Hidro *Mini Hydro*	Air *Water*	11.4	-	-
11	KUB-Berjaya Energy Sdn. Bhd. Hulu Selangor, Selangor	Turbin Gas *Gas Turbines*	Gas Landfill *Landfill Gas*	1.2	n/a	n/a
12	Felda Palm Industries Sdn. Bhd. Jempul, Negeri Sembilan	Turbin Gas *Gas Turbines*	*Palm Oil Mill Effluent (POME)*	1.5	n/a	n/a

1.4 *Co-Generators* Utama
Major Co-Generators

Jadual C.10: Kapasiti Berlesen (MW) dan Unit Penjanaan (MWj)
Table C.10: Licensed Capacity (MW) and Units Generated (MWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Kapasiti Berlesen *Licensed Capacity (MW)*	Jenis Bahan Api *Fuel Type*	Unit Penjanaan (MWj) *Units Generated (MWh)*
	Lesen Awam | *Public License*			
1	TCL Industries (M) Sdn. Bhd. Kemaman, Terengganu (Licence Transferred to Optimistic Organic Sdn. Bhd. on 20/10/2011)	7.00	Gas Asli I *Natural Gas*	1,221
2	Gas District Cooling (KLCC) Sdn. Bhd. Jalan Ampang, Kuala Lumpur	40.00	Gas Asli I *Natural Gas*	86,883
3	Gas District Cooling (KLIA) Sdn. Bhd. Sepang, Selangor	60.00	Gas Asli I *Natural Gas*	265, 014
4	See Sen Chemical Bhd. Kemaman, Terengganu	6.00	Haba Buangan Proses Perindustrian I *Industrial Process Heat Waste*	24,859
5	Shell Refining Company (FOM) Berhad Port Dickson, Negeri Sembilan	35.00	Minyak I *Oil*	48,160
6	Petronas Gas Berhad Kerteh Industrial Area, Terengganu	210.00	Gas Asli I *Natural Gas*	1,401,671
7	Petronas Gas Berhad Gebeng Industrial Area, Pahang	105.00	Gas Asli I *Natural Gas*	748,040
8	Institute of Technology Petronas Sdn. Bhd. Tronoh, Perak	8.40	Gas Asli I *Natural Gas*	38,609
9	Fusion Energy Sdn. Bhd.[3] Kuala Langat, Selangor	418.00	Gas Buangan Proses Perindustrian I *Industrial Process Heat Waste*	-
10	Perstima Utility Sdn. Bhd. Johor Bahru, Johor	5.67	Gas Asli I *Natural Gas*	6,580
11	Optimistic Organic Sdn. Bhd. Kemaman, Terengganu	7.00	Haba Buangan Proses Perindustrian I *Industrial Process Heat Waste*	n/a
	Lesen Persendirian | *Private License*			
1	Perwaja Steel Sdn. Bhd. Kemaman, Terengganu	9.50	Gas Asli I *Natural Gas*	13,362
2	Bernas Production Setia Sdn. Bhd. Sekincan, Selangor	0.23	Bahan Buangan Pertanian *Agricultural Waste*	n/a
3	Padiberas Nasional Berhad Kampong Gajah, Perak	0.65	Bahan Buangan Pertanian *Agricultural Waste*	36
4	Sime Darby Plantation Sdn. Bhd. Batang Berjuntai, Selangor	3.38	Bahan Buangan Pertanian *Agricultural Waste*	3,259

Nota I *Note:*
2 Diberhentikan sementara I *Temporarily suspended*
3 Belum beroperasi I *Not in operation*
n/a Tiada maklumat I *Not available*

No.	Perlesenan & Lokasi I *Licensee & Location*	Kapasiti Berlesen I *Licensed Capacity (MW)*	Jenis Bahan Api I *Fuel Type*	Unit Penjanaan (MWj) I *Units Generated (MWh)*
5	Sime Darby Plantation Sdn. Bhd. Teluk Intan, Perak	1.50	Bahan Buangan Pertanian/ Disel I *Agricultural Waste/Diesel*	4,940
6	Malaysian Newsprint Industries Sdn. Bhd. Mentakab, Pahang	79.20	Bahan Buangan Pertanian *Agricultural Waste*	13,938
7	Titan Petchem (M) Sdn. Bhd. Pasir Gudang, Johor	56.00	Gas Asli I *Natural Gas*	156,680
8	Titan Petrochemicals (M) Sdn. Bhd. Johor Bahru, Johor	42.60	Gas Asli I *Natural Gas*	101,776
9	Tiang Siang Oil Mill (Perak) Sdn. Bhd. Beruas, Perak	4.76	Bahan Buangan Pertanian *Agricultural Waste*	393
10	Central Sugars Refinery Sdn. Bhd. Shah Alam, Selangor	8.23	Gas Asli/Disel *Natural Gas/Diesel*	46,858
11	BASF Petronas Chemicals Sdn. Bhd. Kuantan, Pahang	27.40	Gas Asli I *Natural Gas*	56,871
12	Nibong Tebal Paper Mill Sdn. Bhd. Nibong Tebal Pulau Pinang	0.80	Habuk Kayu I *Wood Dust*	n/a
13	Gas District Cooling (Putrajaya) Sdn. Bhd. Wilayah Persekutuan Putrajaya	10.74	Gas Asli I *Natural Gas*	35,101
14	Petronas Penapisan (Melaka) Sdn. Bhd. Sungai Udang, 76300 Melaka	145.00	Gas Asli I *Natural Gas*	345,355
15	Gas District Cooling (Putrajaya) Sdn. Bhd. Putrajaya, 62000 Putrajaya	6.50	Gas Asli I *Natural Gas*	39,506
16	Muda Paper Mills Sdn. Bhd. Hulu Langat, Selangor	14.40	Gas Asli I *Natural Gas*	94,007
17	Ban Heng Bee Rice Mill (1952) Sdn. Bhd. Pendang, Kedah	0.54	Bahan Buangan Pertanian *Agricultural Waste*	2,153
18	Petronas Fertilizer (Kedah) Sdn. Bhd. Kuala Muda, Kedah	18.31	Gas Asli I *Natural Gas*	42,284
19	Kilang Gula Felda Perlis Sdn. Bhd. Chuping, Perlis	9.78	Gas Buangan Proses Perindustrian I *Industrial Heat Waste*	29,055
20	Gula Padang Terap Sdn. Bhd. Padang Terap, Kedah	10.29	Bahan Buangan Pertanian/ Disel I *Agricultural Waste/Diesel*	24,648
21	Malayan Sugar Manufacturing Co. Bhd. Perai, Pulau Pinang	8.95	Gas Asli I *Natural Gas*	13,478

1.5 Penjanaan Persendirian (Kurang daripada 5 MW)
Self-Generation (Less than 5 MW)

Jadual C.11: Kapasiti Berlesen (MW) dan Unit Penjanaan (MWj)
Table C.11: Licensed Capacity (MW) and Units Generated (MWh)

Jenis Bahan Api I *Fuel Type*		2008	2009	2010	2011
Bilangan Lesen I *Number of Licences*		765	779	795	1,116
Gas	Kapasiti Berlesen I *Licensed Capacity (MW)*	13	3	30	31
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	16,370	33,546	26,923
Disel I *Diesel*	Kapasiti Berlesen I *Licensed Capacity (MW)*	359	394	378	516
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	26,397	811,372	639,879	722,947
Sisa Sawit I *Palm Oil Waste*	Kapasiti Berlesen I *Licensed Capacity (MW)*	319	315	253	358
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	21,324	707,471	613,853	730,138
Biojisim Lain I *Other Biomass*	Kapasiti Berlesen I *Licensed Capacity (MW)*	34	27	29	29
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	6,914	5,276	5,615
Jumlah I *Total*	Kapasiti Berlesen I *Licensed Capacity (MW)*	**725**	**739**	**691**	**933**
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	**47,721**	**1,542,126**	**1,292,554**	**1,485,623**

Nota I *Note:*
n/a Tiada maklumat I *Not available*

2. Maklumat dan Statistik Industri di Sabah | *Industry Information and Statistics in Sabah*

2.1 Statistik Sabah Electricity Sdn Bhd (SESB)
Statistics of Sabah Electricity Sdn Bhd (SESB)

Jadual C.12: Sorotan Prestasi
Table C.12: Performance Highlights

Petunjuk I *Indicator*	2007	2008	2009	2010	2011
Kehendak Maksimum (MW) I *Maximum Demand (MW)*	625	673	719	780	830
Jumlah Unit Penjanaan (GWj) I *Total Units Generated (GWh)*[1]	1,632	1,489	1,317	1,178	1,524
Jumlah Unit Jualan (GWj) I *Total Units Sold (GWh)*	3,317	3,474	3,855	4,127	4,275
Hasil Jualan Elektrik (RM Juta) I *Sales of Electricity (RM Million)*	838	836	975	1,055	1,155
Kapasiti Penjanaan Terpasang (MW) I *Installed Generation Capacity (MW)*[2]	358	357	489	375	435
Jumlah Kakitangan I *Number of Employees*	2,315	2,272	2,484	2,613	2,613
Hasil Jualan Setiap Kakitangan (RM Juta/Kakitangan) *Sales of Electricity per Employee (RM Million/Employee)*	0.36	0.37	0.39	0.40	0.44
Unit Jualan Setiap Kakitangan (GWj/Kakitangan) *Units Sold per Employee (GWh/Kakitangan)*	1.43	1.53	1.55	1.58	1.64
Kapasiti Penjanaan Setiap Kakitangan (MW/Kakitangan) *Installed Capacity per Employee (MW/Employee)*	0.15	0.16	0.20	0.14	0.17
Jumlah Unit Pembelian (GWj) I *Total Units Purchased (GWh)*	2,363	2,788	3,235	3,648	3,765
Jumlah Unit Eksport (GWj) I *Total Units Exported (GWh)*	-	-	-	-	-
Jumlah Unit Import (GWj) I *Total Units Imported (GWh)*	-	-	-	-	-

Jadual C.13: Kapasiti Terpasang (MW) dan Kebolehdapatan Keseluruhan (%)
Table C.13: Installed Capacity (MW) and Overall Availability (%)

Jenis Bahan Api I *Fuel Type*	2007	2008	2009	2010	2011
Hidro I *Hydro*	74	74	74	74	70
Gas Asli I *Natural Gas*	106	107	162	101	107
Arang Batu I *Coal*	-	-	-	-	-
Minyak I *Medium Fuel Oil (MFO)*	-	-	-	-	-
Disel I *Diesel*	178	176	253	200	259
Jumlah I *Total*	358	357	489	375	435
Kebolehdapatan Keseluruhan (%) I Overall Availability (%)	82.9	73.3	64.9	57.0	57.0

Jadual C.14: Campuran Penjanaan (GWj)
Table C.14: Generation Mix (GWh)

Jenis Bahan Api I *Fuel Type*	2007	2008	2009	2010	2011
Hidro I *Hydro*	538	489	393	482	754
Gas Asli I *Natural Gas*	664	675	530	260	398
Arang Batu I *Coal*	-	-	-	-	-
Minyak I *Medium Fuel Oil (MFO)*	-	-	-	-	-
Disel I *Diesel*	430	325	394	436	372
Jumlah I *Total*	1,632	1,489	1,317	1,178	1,524

Nota I *Note:*
1 Jumlah Unit Penjanaan (Jumlah Campuran Penjanaan) bagi SESB tidak termasuk IPP di Sabah I *Generation Mix for SESB excluding IPPs in Sabah*
2 Jumlah Kapasiti Penjanaan Terpasang SESB tidak termasuk IPP di Sabah I *Installed Generation Capacity for SESB excluding IPPs in Sabah*

Jadual C.15: Jualan Tenaga Elektrik (GWj)
Table C.15: Sales of Electricity (GWh)

Sektor I *Sector*	2007	2008	2009	2010	2011
Domestik I *Domestic*	1,039	1,090	1,204	1,295	1,332
Komersil I *Commercial*	1,240	1,321	1,504	1,602	1,742
Industri I *Industry*	993	1,017	1,099	1,178	1,146
Lampu Awam I *Public Lighting*	45	47	49	52	56
Perlombongan I *Mining*	-	-	-	-	-
Eksport I *Export*	-	-	-	-	-
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*[3]	3,317	3,475	3,856	4,127	4,275

Jadual C.16: Bilangan Pengguna
Table C.16: Number of Consumers

Sektor I *Sector*	2007	2008	2009	2010	2011
Domestik I *Domestic*	318,955	332,861	347,640	364,376	384,384
Komersil I *Commercial*	58,345	62,012	65,551	68,877	72,288
Industri I *Industry*	2,706	2,799	2,870	2,971	2,865
Lampu Awam I *Public Lighting*	3,710	3,918	4,117	4,302	4,516
Perlombongan I *Mining*	-	-	-	-	-
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*	383,716	401,590	420,178	440,526	464,053

Jadual C.17: Keupayaan Sistem Penghantaran
Table C.17: Transmission System Capacity

Talian/Kabel Sistem Penghantaran *Transmission System Lines/Cables*	2007	2008	2009	2010	2011
500 kV (km)	-	-	-	-	-
275 kV (km)	492	492	492	492	492
132 kV (km)	1,587	1,672	1,674	1,721	1,780
66 kV (km)	123	123	123	123	123
Pencawang Penghantaran I *Transmission Substations*					
Bilangan I *Number*	34	34	36	39	41
Keupayaan I *Capacity (MVA)*	3,603	3,793	3,913	4,517	4,652
Prestasi I *Performance*					
Bilangan Kejadian Pelantikan I *Number of Tripping Incidents*	136	12	18	26	31
Tenaga yang Tidak Dibekal (MWj) I *Unsupplied Energy (MWh)*	763	162	318	513	804

Nota I *Note:*
3 Jualan Tenaga Elektrik bagi SESB termasuk pembelian dari IPP di Sabah I *Sales of Electricity for SESB includes the energy purchased from IPPs in Sabah*

Jadual C.18: Keupayaan Sistem Pengagihan
Table C.18: Distribution System Capacity

Talian/Kabel Sistem Pengagihan *Distribution System Lines/Cables*	2007	2008	2009	2010	2011
Talian Atas I *Overhead Lines (km)*[4]	5,893	6,431	7,420	7,490	7,761
Kabel Bawah Tanah I *Underground Cables (km)*[4]	623	762	1,035	1,418	1,317
Pencawang Pengagihan I *Distribution Substations*					
Bilangan I *Number*	5,008	5,214	5,614	5,815	5,878
Keupayaan I *Capacity (MVA)*	3,937	4,179	4,235	4,618	4,813
Prestasi I *Performance*					
Bilangan Gangguan Bekalan I *Number of Supply Interruptions*	23,590	21,911	24,969	24,169	23,397

2.2 Penjana Kuasa Bebas (IPP)
Independent Power Producers (IPPs)

Jadual C.19: Kapasiti Berlesen (MW), Unit Penjanaan dan Jualan (GWj)
Table C.19: Licensed Capasity (MW), Units Generated and Sold (GWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Jenis Loji *Plant Type*	Kapasiti Berlesen *Licensed Capacity (MW)*	Unit Penjanaan (GWj) *Units Generated (GWh)*	Unit Jualan (GWj) *Units Sold (GWh)*
1	ARL Tenaga Sdn. Bhd. Melawa, Kota Kinabalu, Sabah	Enjin Disel I *Diesel Engine*	50.0	46	43
2	Serudong Power Sdn. Bhd. Tawau, Sabah	Enjin Disel I *Diesel Engine*	36.0	217	210
3	Stratavest Sdn. Bhd. Sandakan, Sabah	Enjin Disel I *Diesel Engine*	60.0	187	179
4	Sandakan Power Corporation Sdn. Bhd. Sandakan, Sabah	Enjin Disel I *Diesel Engine*	34.1	102	97
5	Sepangar Bay Corporation Sdn. Bhd. Kota Kinabalu, Sabah	Kitar Padu I *Combined Cycle* Turbin Stim I *Steam turbine*	100.0	717	692
6	Ranhill Powertron Sdn. Bhd. Kota Kinabalu, Sabah	Kitar Padu I *Combined Cycle*	190.0	1,211	1,174
7	Ranhill Powertron II Sdn. Bhd. Kota Kinabalu, Sabah	Kitar Padu I *Combined Cycle*	190.0	1,115	1,084

Nota I *Note:*
4 Sistem 33 kV dan 11 kV sahaja I *33 kV and 11 kV system only*

2.3 Projek Janakuasa Kecil Sumber Tenaga Boleh Baharu (SREP)
Small Renewable Energy Power (SREP) Projects

Jadual C.20: Kapasiti Berlesen (MW), Unit Penjanaan dan Jualan (MWj)
Table C.20: Licensed Capacity (MW), Units Generated and Sold (MWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Jenis Loji *Plant Type*	Penggerak Primer/ Jenis Bahan Api *Prime Mover/ Fuel Type*	Kapasiti Berlesen *Licensed Capacity (MW)*	Unit Penjanaan (MWj) *Units Generated (MWh)*	Unit Jualan (MWj) *Units Sold (MWh)*
1	TSH Bio Energy Sdn. Bhd. Tawau, Sabah	Turbin Stim *Steam Turbines*	Sisa Sawit *Palm Oil Waste*	14.0	77,572	66,214
2	Seguntor Bioenergy Sdn. Bhd. Sandakan, Sabah	Turbin Stim *Steam Turbines*	Tandan Sawit Kosong I *Empty Fruit Bunch*	13.5	73,687	59,186
3	Kina Biopower Sdn. Bhd. Sandakan, Sabah	Turbin Stim *Steam Turbines*	Tandan Sawit Kosong I *Empty Fruit Bunch*	11.5	66,828	55,570
4	Syarikat Esajadi Power Sdn. Bhd. Kota Marudu, Sabah	Hidro Mini *Mini Hydro*	Air *Water*	4.5	8,190	8,190
5	Syarikat Esajadi Power Sdn. Bhd. Sungai Kaingaran Tambunan, Sabah	Hidro Mini *Mini Hydro*	Air *Water*	2.5	-	-
6	Syarikat Esajadi Power Sdn. Bhd. Sungai Kadamaian Kota Belud, Sabah	Hidro Mini *Mini Hydro*	Air *Water*	2.0	12,115	12,115

2.4 *Co-Generators* Utama
Major Co-Generators

Jadual C.21: Kapasiti Berlesen (MW) dan Unit Penjanaan (MWj)
Table C.21: Licensed Capacity (MW) and Units Generated (MWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Kapasiti Berlesen *Licensed Capacity (MW)*	Bahan Api *Fuel Type*	Unit Penjanaan (MWj) *Units Generated (MWh)*
	Lesen Awam | *Public License*			
1	Eksons Biomass Energy Sdn. Bhd. Merotai, Tawau, 91000 Sabah	3.00	Tandan Sawit Kosong *Empty Fruit Bunch*	17,583
2	Bio Fuel Asia Sdn. Bhd. Kunak, Lahad Datu, Sabah	10.00	Habuk Kayu I *Wood Waste*	4
3	Evergreen Intermerge Sdn. Bhd. Tanjung Batu Laut, Tawau, Sabah	6.00	Tandan Sawit Kosong *Empty Fruit Bunch*	4,796
4	Seo Energy Sdn. Bhd. Karamunting, Sandakan, Sabah	1.20	Tandan Sawit Kosong *Empty Fruit Bunch*	2,531
5	Petronas Methanol (Labuan) Sdn. Bhd. Kawasan Perindustrian Ranca-Ranca Labuan, Wilayah Persekutuan Labuan	41.80	Gas Asli *Natural Gas*	97,678
6	Profound Heritage Sdn. Bhd. Kota Kinabalu, Sabah	38.00	Disel I *Diesel*	101,483
7	IJM Biofuel Sdn. Bhd.[5] Sandakan, Sabah	3.60	Tandan Sawit Kosong *Empty Fruit Bunch*	-
8	IOI Bio-Energy Sdn. Bhd.[5] Sandakan, Sabah	15.00	Biojisim I *Biomass*	-
	Lesen Persendirian | *Private License*			
1	Felda Palm Industries Sdn. Bhd. Gugusan Felda Sahabat Mukim Tungku, Daerah Lahad Datu Sabah	7.50	Tandan Sawit Kosong/Disel *Empty Fruit Bunch/Diesel*	12,618
2	Palm Energy Sdn. Bhd. No. Lot CL 115311138 Mukim Lahad Datu Daerah Lahad Datu, Sabah	6.50	Bahan Buangan Pertanian *Agricultural Waste*	12,008
3	Sabah Forest Industries Sdn. Bhd. Mukim Kg. Sebubuh Daerah Sipitang, Sabah	57.00	Sisa Kayu / Disel *Wood Waste/Diesel*	254,856

Nota I *Note:*
5 Belum beroperasi I *Not in operation*

2.5 Penjanaan Persendirian (Kurang daripada 5 MW)
Self-Generation (Less than 5 MW)

Jadual C.22: Kapasiti Berlesen (MW) dan Unit Penjanaan (MWj)
Table C.22: Licensed Capacity (MW) and Units Generated (MWh)

Jenis Bahan Api I *Fuel Type*		2008	2009	2010	2011
Bilangan Lesen I *Number of Licences*		881	955	969	1,002
Gas	Kapasiti Berlesen I *Licensed Capacity (MW)*	3.70	5.70	5.70	5.70
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	1,275	1,426	2,958
Disel I *Diesel*	Kapasiti Berlesen I *Licensed Capacity (MW)*	523	509	512	499
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	111,493	99,344	68,208
Sisa Sawit I *Palm Oil Waste*	Kapasiti Berlesen I *Licensed Capacity (MW)*	108	119	115	122
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	208,465	221,649	244,408
Biojisim Lain I *Other Biomass*	Kapasiti Berlesen I *Licensed Capacity (MW)*	3.66	1.41	7.13	7.13
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	135	7,085	9,261
Jumlah I *Total*	Kapasiti Berlesen I *Licensed Capacity (MW)*	638	636	641	634
	Unit Penjanaan (MWj) I *Units Generated (MWh)*	n/a	321,368	329,504	324,835

Nota I *Note:*
n/a Tiada maklumat I *Not available*

3. Maklumat dan Statistik Industri di Sarawak
Industry Information and Statistics in Sarawak

3.1 Statistik Sarawak Energy Berhad (SEB)
Statistics of Sarawak Energy Berhad (SEB)

Jadual C.23: Sorotan Prestasi
Table C.23: Performance Highlights

Petunjuk I *Indicator*	2007	2008	2009	2010	2011*
Kehendak Maksimum (MW) I *Maximum Demand (MW)*	834	860	996	1,091	1,278
Jumlah Unit Penjanaan (GWj) I *Total Units Generated (GWh)*	2,552	2,555	2,234	2,321	7,279
Jumlah Unit Jualan (GWj) I *Total Units Sold (GWh)*[1]	4,272	4,421	4,540	5,728	6,486
Hasil Jualan Elektrik (RM Juta) I *Sales of Electricity (RM Million)*	1,216	1,289	1,342	1,518	1,673
Kapasiti Penjanaan Terpasang (MW) I *Installed Generation Capacity (MW)*[2]	549	546	530	530	1,358
Jumlah Kakitangan I *Number of Employees*	2,054	2,143	2,212	2,242	3,529
Hasil Jualan Setiap Kakitangan (RM Juta/Kakitangan) *Sales of Electricity per Employee (RM Million/Employee)*	0.59	0.60	0.61	0.68	0.47
Unit Jualan Setiap Kakitangan (GWj/Kakitangan) *Units Sold per Employee (GWh/Kakitangan)*	2.08	2.06	2.05	2.55	1.84
Kapasiti Penjanaan Setiap Kakitangan (MW/Kakitangan) *Installed Capacity per Employee (MW/Employee)*	0.27	0.25	0.24	0.24	0.38
Jumlah Unit Pembelian (GWj) I *Total Units Purchased (GWh)*	2,639	2,851	3,643	4,672	759
Jumlah Unit Eksport (GWj) I *Total Units Exported (GWh)*	-	-	-	-	-
Jumlah Unit Import (GWj) I *Total Units Imported (GWh)*	-	-	-	-	-

Jadual C.24: Kapasiti Terpasang (MW)
Table C.24: Installed Capacity (MW)

Jenis Bahan Api I *Fuel Type*	2007	2008	2009	2010	2011
Hidro I *Hydro*	101	101	101	101	101
Gas Asli I *Natural Gas*	271	271	271	271	675
Arang Batu I *Coal*	-	-	-	-	480
Minyak I *Medium Fuel Oil (MFO)*	-	-	-	-	-
Disel I *Diesel*	177	174	158	158	102
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*	549	546	530	530	1,358

Jadual C.25: Campuran Penjanaan (GWj)
Table C.25: Generation Mix (GWh)

Jenis Bahan Api I *Fuel Type*	2007	2008	2009	2010	2011
Hidro I *Hydro*	428	527	461	542	424
Gas Asli I *Natural Gas*	1,790	1,672	1,479	1,516	3,243
Arang Batu I *Coal*	-	-	-	-	3,368
Minyak I *Medium Fuel Oil (MFO)*	-	-	-	-	-
Disel I *Diesel*	334	356	294	263	244
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*	2,552	2,555	2,234	2,321	7,279

Nota I *Note:*
1 Jumlah Unit Penjanaan (Jumlah Campuran Penjanaan) bagi SEB tidak termasuk IPP di Sarawak I *Generation Mix for SEB excluding IPPs in Sarawak*
2 Jumlah Kapasiti Penjanaan Terpasang SEB tidak termasuk IPP di Sarawak I *Installed Generation Capacity for SEB excluding IPPs in Sarawak*
* Penstrukturan semula SEB pada tahun 2011 | *Restructuring of SEB in 2011*

Jadual C.26: Jualan Tenaga Elektrik (GWj)
Table C.26: Sales of Electricity (GWh)

Sektor I *Sector*	2007	2008	2009	2010	2011
Domestik I *Domestic*	1,098	1,132	1,249	1,335	1,423
Komersil I *Commercial*	1,421	1,497	1,623	1,735	1,846
Industri I *Industry*	1,691	1,726	1,606	2,593	3,151
Lampu Awam I *Public Lighting*	62	66	62	64	66
Perlombongan I *Mining*	-	-	-	-	-
Eksport I *Export*	-	-	-	-	-
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*[3]	4,272	4,421	4,540	5,728	6,486

Jadual C.27: Bilangan Pengguna
Table C.27: Number of Consumers

Sektor I *Sector*	2007	2008	2009	2010	2011
Domestik I *Domestic*	376,137	391,875	406,119	424,550	444,340
Komersil I *Commercial*	64,787	67,480	70,040	72,921	76,222
Industri I *Industry*	889	900	905	923	947
Lampu Awam I *Public Lighting*	5,937	6,149	6,507	6,811	7,042
Perlombongan I *Mining*	-	-	-	-	-
Lain-lain I *Others*	-	-	-	-	-
Jumlah I *Total*	447,750	466,404	483,571	505,205	528,551

Jadual C.28: Keupayaan Sistem Penghantaran
Table C.28: Transmission System Capacity

Talian/Kabel Sistem Penghantaran *Transmission System Lines/Cables*	2007	2008	2009	2010	2011
500 kV (km)	-	-	-	-	-
275 kV (km)	765	765	765	765	867
132 kV (km)	138	138	225	225	235
66 kV (km)	-	-	-	-	-
Pencawang Penghantaran I *Transmission Substations*					
Bilangan I *Number*	20	22	23	24	22
Keupayaan I *Capacity (MVA)*	4,166	4,726	4,806	4,886	5,206
Prestasi I *Performance*					
Bilangan Kejadian Pelantikan I *Number of Tripping Incidents*	1	9	4	7	8
Tenaga yang Tidak Dibekal (MWj) I *Unsupplied Energy (MWh)*	9.6	662	57	191	507

Nota I *Note:*
3 Jualan Tenaga Elektrik bagi SEB termasuk pembelian dari IPP di Sarawak I *Sales of Electricity for SEB includes the energy purchased from IPPs in Sarawak*

Jadual C.29: Keupayaan Sistem Pengagihan
Table C.29: Distribution System Capacity

Talian/Kabel Sistem Pengagihan *Distribution System Lines/Cables*	2007	2008	2009	2010	2011
Talian Atas I *Overhead Lines (km)*	17,126	18,565	19,147	19,803	20,254
Kabel Bawah Tanah I *Underground Cables (km)*	5,040	5,422	5,709	6,087	6,450
Pencawang Pengagihan I *Distribution Substations*					
Bilangan I *Number*	7,926	8,290	8,500	8,685	9,130
Keupayaan I *Capacity (MVA)*	5,642	6,217	3,218	3,321	3,490
Prestasi I *Performance*					
Bilangan Gangguan Bekalan I *Number of Supply Interruptions*	7,915	8,124	7,868	8,003	7,759

3.2 Penjana Kuasa Bebas (IPP)
Independent Power Producers (IPPs)

Jadual C.30: Kapasiti Terpasang (MW), Unit Penjanaan dan Jualan (GWj)
Table C.30: Installed Capacity (MW), Units Generated and Sold (GWh)

No.	Pemegang Lesen & Lokasi *Licensee & Location*	Jenis Loji *Plant Type*	Kapasiti Berlesen (MW) *Licensed Capacity (MW)*	Unit Penjanaan (GWj) *Units Generated (GWh)*	Unit Jualan (GWj) *Units Sold (GWh)*
1	Sarawak Hidro Sdn. Bhd.[4] Bakun, Sarawak	Hidro *Hydro*	2,400[5]	776	759

Nota I *Note:*
4 Bakun dimiliki dan dikendalikan oleh entiti di bawah kerajaan persekutuan | *Bakun is owned and operated by an entity under the federal government*
5 Pada tahun 2011, pengoperasian sebanyak 900 MW kapasiti terpasang berbanding jumlah kapasiti berlesen keseluruhan sebanyak 2,400 MW
In 2011, operating a total installed capacity of 900MW out of the total licensed capacity of 2,400 MW

4. Senarai Pengagih Elektrik di Semenanjung Malaysia dan Sabah
List of Electricity Distributors in Peninsular Malaysia and Sabah

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*
1	Gas District Cooling (KLIA) Sdn. Bhd. Jalan KLIA S5 (KLIA Selatan) Southern Support Zone 64000 KLIA, Sepang, Selangor. Tel : 03-8787 4326 Fax : 03-8787 4282	Kuala Lumpur International Airport Daerah Sepang Selangor.	60.00 **	01-01-1996
2	Port Klang Authority Beg Berkunci 202, Jalan Pelabuhan Utara 42005 Pelabuhan Klang, Selangor. Tel : 03-3168 8211 Fax : 03-3167 0211 / 3168 9117	Kelang Port Authority Premis Jalan Pelabuhan 42005 Port Klang, Selangor.	5.80	25-03-1997
3	Pangkalan Bekalan Kemaman Sdn. Bhd. P.O. Box 64, Kemaman Supply Base 24007 Kemaman, Terengganu. Tel : 09-863 1566 Fax : 09-863 1716	Kawasan Pangkalan Bekalan Kemaman Kemaman, Terengganu.	3.31	01-12-1997
4	Malaysia Airports (Sepang) Sdn. Bhd. 3rd & 4th Floor, Airport Management Centre KL International Airport, 64000 KLIA, Selangor. Tel : 03-8776 9555 Fax : 03-8926 5510 / 8926 5209	PT 13, PT 89, PT 39 Bandar Lapangan Terbang Antarabangsa Sepang Daerah Sepang, Selangor.	120.00	14-02-1998
5	Petronas Gas Bhd. Centralized Utility Facilities (CUF) Integrated Petrochemical Complex KM 106, Jalan Kuantan/Kuala Terengganu 24300 Kertih, Kemaman, Terengganu. Tel : 09-830 5000 Fax : 09-830 5514	Petrochemical Complex Kerteh Industrial Area Terengganu.	210.00 **	28-05-1998
6	Petronas Gas Bhd. Centralized Utility Facilities (CUF) Integrated Petrochemical Complex Lot 139A, Gebeng Industrial Area, Phase III 26080 Kuantan, Pahang. Tel : 09-586 3300 Fax : 09-586 3311 / 586 3328	Petrochemical Complex Gebeng Industrial Area Pahang.	105.00 **	28-05-1998
7	K.K.I.P. Power Sdn. Bhd. Lot A7, Salut Commercial Centre Kota Kinabalu Industrial Park, Jalan Politeknik 88460 Kota Kinabalu, Sabah. Tel : 088-497 801 / 497 802 Fax : 088-498 177	Kota Kinabalu Industrial Park (KKIP) Sabah.	210.00	15-06-1998
8	Nur Distribution Sdn. Bhd. (Receivers And Managers Appointed) Central Control Building (CCB) Lot 30 Jalan Hi-Tech 4 Kulim Hi-Tech Park, 09000 Kulim, Kedah. Tel : 04-401 0100 Fax : 04-401 0344 / 401 0319	Kulim Hi-Tech Industrial Park Kedah.	440.00	17-09-1998
9	Gas District Cooling (KLCC) Sdn. Bhd. Level 1, Bangunan DCCI Persiaran KLCC, Off Jalan Ampang 50088 Kuala Lumpur. Tel : 03-2380 5660 Fax : 03-2381 7086	Bangunan DCC 1 / DCC 2 KLCC DCS/Co-Generation Plant Persiaran KLCC, Jalan Ampang 50088 Kuala Lumpur.	40.00 **	30-08-2000

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	Genting Utilities & Services Sdn. Bhd. Tingkat 24, Wisma Genting Jalan Sultan Ismail 50250 Kuala Lumpur. Tel : 03-2333 2288 / 2178 2288 Fax : 03-2161 5304 / 2164 7480	Kawasan Genting Highlands Negeri Pahang/Selangor.	48.00	17-10-2000
11	TCL Industries (Malaysia) Sdn. Bhd. Plot No: 4248, Teluk Kalong Industrial Estate 24007 Kemaman, Terengganu. Tel : 09-863 3029 / 863 3031 Fax : 09-863 3085 *(Licence Transferred to Optimistic Organic Sdn. Bhd. on 20/10/2011)*	Plot No. 4248 Teluk Kalong Industrial Estate 24007 Kemaman, Terengganu.	7.00 **	15-09-2003
12	Ikano Corporation Sdn. Bhd. No. 2, Jalan PJU 7/2, Mutiara Damansara 47800 Petaling Jaya, Selangor. Tel : 03-7720 7333 Fax : 03-7725 3361	Lot PT 400038 Mutiara Damansara 47800 Petaling Jaya, Selangor	7.94	23-12-2003
13	Jaya Jusco Stores Berhad Jusco Taman Universiti Shopping Centre No. 4, Jalan Pendidikan, Taman Universiti 81300 Skudai, Johor. Tel : 07-520 8700 Fax : 07-521 3000	PTD 62861, Jalan Pendidikan Taman Universiti Mukim Pulai Daerah Johor Bahru, Johor.	3.11	28-02-2004
14	Institute Of Technology Petronas Sdn. Bhd. Bandar Seri Iskandar 31750 Tronoh, Perak. Tel : 05-368 8000 Fax : 05-365 4075	Kampus Universiti Teknologi Petronas Tronoh, Perak.	8.40 **	26-01-2006
15	Eng Lian Enterprise Sdn. Bhd. 9, Jalan Ampang #05-00 50450 Kuala Lumpur. Tel : 03-2056 0600 / 2288 1800 Fax : 03-2056 0700	Lot 51533 Mukim Kuala Lumpur Kuala Lumpur.	2.29	01-03-2006
16	AEON Co. (M) Bhd. Jusco Metro Prima Shopping Centre 1st. Floor, No. 1, Jalan Metro Prima 52100 Kepong, Kuala Lumpur. Tel : 03-6259 1122 Fax : 03-6259 2805 / 6259 1805	PT 20954 Mukim Batu Kuala Lumpur.	4.83	15-3-2006
17	Fawanis Sdn. Bhd. 13th Floor, Wisma Denmark 86, Jalan Ampang 50450 Kuala Lumpur. Tel : 03-2032 2111 Fax : 03-2078 4679	Queen's Park Retail Centre Lot 392, Batu 2 - 2 Jalan Cheras Kuala Lumpur.	0.94	11-5-2006
18	Profound Heritage Sdn. Bhd. 1st Floor, Lorong Grace Square Jalan Pantai Sembulan 88100 Kota Kinabalu, Sabah. Tel : 088-318 801 / 318 802 Fax : 088-233 362	Sutera Harbour Resort Lot 2, La. 93010260 Kota Kinabalu Sabah.	38.00 **	01-10-2006
19	Evergreen Intermerge Sdn. Bhd. Teck Guan Regency, 318 Jalan St Patrick Off Jalan Belunu, P.O. Box No. 33 91007 Tawau, Sabah. Tel : 089-758 955 Fax : 089-760 955	Cacao Paramount Sdn. Bhd. Lot CL 105323797 KM 3, Tanjung Batu Laut Tawau, Sabah.	6.00 **	10-10-2006

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*
20	Seo Energy Sdn. Bhd. KM 8, Jalan Batu Sapi Karamunting, P.O. Box 2605 90729 Sandakan, Sabah. Tel : 089-611 011 / 611 012 Fax : 089-611 014 / 617 355	Sandakan Edible Oils Sdn. Bhd. KM 8, Jalan Batu Sapi Karamunting, Sandakan Sabah.	1.20 **	10-10-2006
21	Wirazone Sdn. Bhd. Level 13A, Block 3B, Plaza Sentral Jalan Stesen Sentral 5, 50470 Kuala Lumpur. Tel : 03-2263 3388 Fax : 03-2263 3366	Kaw. Pembangunan Kuala Lumpur Sentral Kuala Lumpur.	100.00	15-10-2006
22	Sunway Carnival Sdn. Bhd. (Sunway IFM Sdn. Bhd.) LG-68 Management Office, Sunway Carnival Mall 3068, Jalan Todak, Pusat Bandar Seberang Jaya 13700 Seberang Jaya, Pulau Pinang. Tel : 04-397 9888 Fax : 04-397 9883	Lot 5497, 5498 Dan 5499 Daerah Seberang Perai Tengah Pulau Pinang.	5.00	01-11-2006
23	Asian Supply Base Sdn. Bhd. Ranca-Ranca Industrial Estate P.O. Box 80751 87017 Wilayah Persekutuan Labuan, Sabah. Tel : 087-411 611 / 411 614 Fax : 087-415 477	Asian Supply Base Lot 206291581, Daerah Labuan Wilayah Persekutuan Labuan Sabah.	12.00	13-11-2006
24	ASM Properties Sdn. Bhd. Level 21, Maju Tower 1001 Jalan Sultan Ismail 50250 Kuala Lumpur. Tel : 03-2772 8500 Fax : 03-2772 8501	Maju Junction Mall Lot PT 19 Seksyen 46 Kuala Lumpur.	10.80	24-11-2006
25	Lembaga Tabung Haji Tingkat 7, Bangunan TH Perdana 1001, Jalan Sultan Ismail, 50250 Kuala Lumpur. Tel : 03-2781 9020 Fax : 03-2781 9023	Menara TH Perdana Lot 101, Mukim Kuala Lumpur Kuala Lumpur.	3.00	29-12-2006
26	TSH-Wilmar (BF) Sdn. Bhd. Bangunan TSH, TB9 KM 7, Apas Road, 91000 Tawau, Sabah. Tel : 089-912 020 / 911 056 Fax : 089-913 000	TSH Edible Oils Sdn Bhd PL 26166110 & 246290228 Kunak, Lahad Datu, Sabah.	10.00 **	29-12-2006
27	AEON Co. (M) Bhd. AEON Cheras Selatan Shopping Centre Aras 1, Lebuh Tun Hussein Onn 43200 Balakong, Selangor. Tel : 03-9080 3498 Fax : 03-9080 3598	AEON Cheras Selatan Shopping Centre PT 41977 (Sebahagian Lot 2225) Mukim Cheras Daerah Hulu Langat, Selangor.	8.16	05-02-2007
28	Eksons Biomass Energy Sdn. Bhd. TB 4327, 2nd Floor, Block 31 Fajar Complex, Jalan Haji Karim 91000 Tawau, Sabah. Tel : 089-757 911 / 757 913 Fax : 089-761 022	Rajang Plywood (Sabah) Sdn. Bhd. CLS 105486762, 105486771 Dan PT 2000100538, Sungai Umas Umas Mukim Merotai, Tawau 91000 Sabah.	3.00 **	07-03-2007

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*
29	Urusharta Cemerlang Sdn. Bhd. Level 10 Pavilion Kuala Lumpur 168, Jalan Bukit Bintang 55100 Kuala Lumpur. Tel : 03-2118 8888 / 2118 8880 Fax : 03-2118 8889 / 2118 8911	Pavilion Kuala Lumpur Lot 174, 185, 187, 188, 281 (Lot Baru : 332) Dan 260 Jalan Bukit Bintang/Jalan Raja Chulan, Seksyen 67, Kuala Lumpur.	22.10	14-03-2007
30	AEON Co. (M) Bhd. Jusco Seremban 2 Shopping Centre 112, Persiaran S2 B1 Seremban 270300 Seremban, Negeri Sembilan. Tel : 06-601 5643 / 601 5618 Fax : 06-601 5645	AEON Seremban 2 Lot PT 10787 Hs(D) 97966 & PT 10790 Hs(D) 97969 Mukim Rasah Daerah Seremban Negeri Sembilan.	7.05	30-03-2007
31	Mid Valley City Energy Sdn. Bhd. Level 32, The Gardens South Tower Mid Valley City, Lingkaran Syed Putra 59200 Kuala Lumpur. Tel : 03-2289 8302 Fax : 03-2938 3230 / 2289 8981	The Gardens (Phase 2) Lot PT 13, Mukim Kuala Lumpur Daerah Kuala Lumpur 59200 Wilayah Persekutuan.	55.00	03-05-2007
32	Bandar Utama City Corporation Sdn. Bhd. 1, Persiaran Bandar Utama Bandar Utama, 47800 Petaling Jaya, Selangor. Tel : 03-7728 8878 / 7726 3171 Fax : 03-7728 9978	Kawasan Pembangunan Bandar Utama Lot PT 37649, 37650,17970-17974, 17976 & 15366, Mukim Sungai Buloh PT 18 & 17968, Bandar Petaling Jaya, PT 22, 23, 44, 45, 83, Lot 27657-27659, 27962, 27669, 27671, 27673-27676, 27679 & 27680, Seksyen 39, Bandar Petaling Jaya, Daerah Petaling 47800 Selangor.	100.00	10-05-2007
33	Perbadanan Memajukan Iktisad Negeri Terengganu Tingkat 14, Menara Permint, Jalan Sultan Ismail 20200 Kuala Terengganu, Terengganu. Tel : 09-627 8000 Fax : 09-623 3880	Pulau Kapas Mukim Rusila, Daerah Marang 21600 Terengganu.	0.45 **	01-06-2007
34	Fusion Energy Sdn. Bhd. Lot 2319, Kaw. Perindustrian Olak Lempit Mukim Tanjung 12, 42700 Banting, Selangor. Tel : 03-3182 2000 Fax : 03-3182 2382 / 3182 2279	Lion Group Complex, Lot 2319, 2320, 2321, 2323, 2582, 2823 & 2824, Mukim Tanjung Dua Belas Daerah Kuala Langat 42700 Selangor.	418.00 *	12-06-2007
35	Petronas Methanol (Labuan) Sdn. Bhd. Ranca-Ranca Industrial Estate, P.O. Box No. 80079 87010 Wilayah Persekutuan Labuan. Tel : 087-411 211 Fax : 087-413 921 / 425 831 Tel : 09-747 6622 Fax : 09-747 5900	Kawasan Perindustrian Ranca-Ranca, Labuan 87010 Wilayah Persekutuan Labuan.	41.80 **	18-07-2007

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*
36	Eng Lian Enterprise Sdn. Bhd. 9 Jalan Ampang #05-00, 50450 Kuala Lumpur. Tel : 03-2056 0600 / 2288 1800 Fax : 03-2056 0700	Bangsar Village Lot 43872, 43873 Dan 43874 Mukim Kuala Lumpur Daerah Kuala Lumpur 59100 Wilayah Persekutuan.	3.12	03-09-2007
37	Y.S. Tang Holdings Sdn. Bhd. 1-888, KB Mall, Jalan Hamzah 15050 Kota Bharu, Kelantan. Tel : 09-747 6622 Fax : 09-747 5900	KB Mall, PT 101 Jalan Hamzah, Seksyen 16 Bandar Kota Bharu 15050 Kelantan.	3.16	18-09-2007
38	Jurus Kota Sdn. Bhd. 2-888, M-Floor, Alor Star Mall Kawasan Perusahaan Tandop Baru. Tel : 04-772 9233 Fax : 04-771 2033	Alor Star Mall, Lot 801 & 802 Dalam Kawasan Perniagaan Dan Industri Kecil Sri Tandop 1 Mukim Pengkalan Kundor Daerah Kota Setar, Kedah.	3.59	18-09-2007
39	Astral Realty Sdn. Bhd. East Coast Mall, Level 3 Jalan Putra Square 6, Putra Square 25200 Kuantan, Pahang. Tel : 09-560 9595 Fax : 09-560 9597	Putra Square, Lot 423 (PN 5596) Mukim Kuantan 25000 Kuantan, Pahang.	4.79	10-10-2007
40	C.S. Khin Developments Sdn. Bhd. 6th Floor, Wisma Mirama Jalan Wisma Putra, 50460 Kuala Lumpur. Tel : 03-2142 1666 Fax : 03-2148 1229	Wisma Mirama Lot 888, Section 69 50460 Kuala Lumpur Wilayah Persekutuan.	0.85	10-10-2007
41	Wisma Central Management Corporation Lot 2.142, 1st Floor, Wisma Central Jalan Ampang, Box #198 50450 Kuala Lumpur. Tel : 03-2161 7522 Fax : 03-2161 9721	Wisma Central Geran 10015, Lot 150 Seksyen 58, Bandar Kuala Lumpur 50450 Wilayah Persekutuan.	2.20	31-10-2007
42	AEON Co. (M) Bhd. AEON Bukit Tinggi Shopping Centre, Level 1 No. 1, Persiaran Batu Nilam 1/KS 6 Bandar Bukit Tinggi 2, 41200 Klang, Selangor. Tel : 03-3326 2370 Fax : 03-3326 2371	AEON Co. (M) Bhd. Mall Lot PT 2042 HS(D) 105957 & PT 2043 HS(D) 105958 Mukim Klang, Daerah Klang Selangor.	12.00	11-12-2007
43	Tradewinds Properties Sdn. Bhd. 21st Floor, Wisma Zelan No. 1, Jalan Tasik Permaisuri 2 Bandar Tun Razak, Cheras 56000 Kuala Lumpur. Tel : 03-9106 3166 Fax : 03-9106 3177	Kompleks Antarabangsa Lot 1158, Seksyen 57 Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur 50250 Wilayah Persekutuan.	4.97	11-12-2007

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*
44	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Kuala Terengganu (Complex Division), Lot PT 1485 Jalan Padang Hiliran, 21100 Cabang Tiga Kuala Terengganu, Terengganu. Tel : 09-631 9220 Fax : 09-631 9230	GCH Retail (Malaysia) Sdn. Bhd. Mall HS(D) 5917, PT 1485 Mukim Cabang Tiga Daerah Kuala Terengganu 21100 Terengganu.	3.30	09-01-2008
45	Awona Land Sdn. Bhd. Suite 4.09.03, 4th Floor, Central Square No. 23, Jalan Kampung Baru 08000 Sungai Petani, Kedah. Tel : 04-421 2268 / 423 8288 Fax : 04-422 4552	Central Square Shopping Centre Lot 134 HS(D) 759/95 Mukim Sungai Petani Daerah Kuala Muda 08000 Kedah.	4.10	14-03-2008
46	AEON Co. (M) Bhd. Jusco Kinta City Shopping Centre No. 2, Jalan Teh Lean Swee Off Jalan Sultan Azlan Shah Utara 31400 Ipoh, Perak. Tel : 05-548 4668 / 545 0913 Fax : 05-546 0899	AEON Kinta City Shopping Centre Lot 51150, Mukim Ulu Kinta Daerah Kinta 31400 Ipoh, Perak.	7.65	18-03-2008
47	Rakyat Holdings Sdn. Bhd. Ground Floor, No. 155 Wisma Perkeso, Jalan Tun Razak 50400 Kuala Lumpur. Tel : 03-2681 6255 Fax : 03-2681 9155	Bangunan Angkasa Raya Lot 149, Seksyen 58 Mukim Kuala Lumpur Daerah Kuala Lumpur.	2.44	19-03-2008
48	Menara Hap Seng Sdn. Bhd. 19th Floor, Menara Hap Seng Letter Box No. 83, Jalan P. Ramlee 50250 Kuala Lumpur. Tel : 03-2145 1363 / 2145 9363 Fax : 03-2145 7818	Menara Hap Seng Lot 593 & 594 Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur 50250 Kuala Lumpur Wilayah Persekutuan.	4.82	19-03-2008
49	1 Borneo Management Corporation Sdn. Bhd. G-600a, Ground Floor 1borneo Hypermall, Jalan Sulaman 88400 Kota Kinabalu, Sabah. Tel : 088-447 744 Fax : 088-447 743	Kompleks Beli-Belah 1 Borneo Hypermall CL 015607057 Mukim Kuala Menggatal Dearah Kota Kinabalu 88450 Sabah.	20.00	08-04-2008
50	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Kuantan Lot 5197, Jalan Tanah Putih, Seksyen 124 25150 Kuantan, Pahang. Tel : 09-515 6999 Fax : 09-515 6466	Lot 5197 Mukim Kuantan Daerah Kuantan 25100 Pahang.	2.96	10-04-2008

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*
51	AEON Co. (M) Bhd. AEON Seberang Prai City Shopping Centre 1st Floor, Management Office Perdana Mall, Jalan Perda Timur 14000 Bukit Mertajam Seberang Prai Tengah, Pulau Pinang. Tel : 04-537 8055 / 537 8022 Fax : 04-537 9022	Lot H.S.(M): 378 / PT 802 Mukim 6 & 7 Seberang Perai Tengah 14000 Pulau Pinang.	14.00	28-04-2008
52	Malaysian Airlines System Berhad 3rd Floor, Administration Building 1 MAS Complex A, Sultan Abdul Aziz Shah Airport 47200 Subang, Selangor. Tel : 03-7843 3000 Fax : 03-8783 3089	Kompleks Kampus MAS Lot PT 19, Mukim Dengkil Daerah Sepang 64000 Selangor.	25.00	29-04-2008
53	Amtrustee Berhad Hektar Premier Sdn. Bhd. Lot F36, First Floor, Subang Parade No. 5, Jalan SS 16/1 47500 Subang Jaya, Selangor. Tel : 03-5032 9778 / 5633 2530 Fax : 03-5633 8079	Subang Parade Lot 14193 Mukim Bandar Subang Jaya Daerah Petaling 47500 Selangor.	10.00	07-05-2008
54	GCH Retail (Malaysia) Sdn. Bhd. Giant Superstore Ulu Klang - Complex Division Lot 13793 & 13796, Jalan Changkat Permata Taman Permata, 53300 Kuala Lumpur. Tel : 03-4106 2275 / 4105 3194 Fax : 03-4106 7414	Lot 13793 Dan 13796 Mukim Setapak Daerah Gombak 53300 Selangor.	2.68	20-05-2008
55	Reliable Capacity Sdn. Bhd. G-M-1, Axis Atrium @ Axis Pandan, Jalan Cempaka Taman Cempaka, 68000 Ampang, Selangor. Tel : 03-9281 2307 Fax : 03-9281 2305	Parcel 1 Perdagangan Axis Atrium No. Lot 27985, Mukim Ampang Daerah Hulu Langat, Selangor.	3.60 *	13-06-2008
56	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Tampoi Complex Management Division, Lot 54 Jalan Skudai, 81200 Tampoi, Johor Bahru, Johor. Tel : 07-238 2353 Fax : 07-238 2354	Lot 54 , Mukim Tampoi Daerah Johor Bharu 81200 Johor.	5.10	08-07-2008
57	GCH Retail (Malaysia) Sdn. Bhd. (Complex Division - Giant Hypermarket Plentong) 3, Jalan Masai Lama, Mukim Plentong 81750 Johor Bharu, Johor. Tel : 07-358 1402 Fax : 07-352 6532	Lot PTD 116058 Dan 116059 Mukim Plentong Daerah Johor Bharu Johor.	4.20	17-07-2008
58	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Skudai Lot 3066 & 3067, Mukim Tebrau 81200 Johor Bharu, Johor. Tel : 07-554 7233 Fax : 07-554 7229	Lot 3066 & 3067 Mukim Terbau Daerah Johor Bharu 81200 Johor.	3.70	12-08-2008
59	Panglobal Insurance Bhd. (Panglobal Marketing Berhad) Suite 34.01, Level 34, Menara KH Jalan Sultan Ismail, 50250 Kuala Lumpur. Tel : 03-2141 1010 Fax : 03-2141 5103	Panglobal Building Lot 53 Section 20 Bandar Petaling Jaya Daerah Petaling Jaya, Selangor.	1.70	24-10-2008

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*
60	Lianbang Ventures Sdn. Bhd. F4-40, Level 4, Dataran Pahlawan Melaka Megamall, Jalan Merdeka 75000 Bandar Hilir, Melaka. Tel : 06-282 1828 Fax : 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
61	GCH Retail (Malaysia) Sdn. Bhd. Giant Mall Kelana Jaya No. 33, Jalan SS 6/12, SS 6, Kelana Jaya 47301 Petaling Jaya, Selangor. Tel : 03-7880 4714 Fax : 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
62	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Shah Alam Stadium Mezzanine Floor, Lot 2, Persiaran Sukan Seksyen 13, 41000 Shah Alam, Selangor. Tel : 03-5544 8888 Fax : 03-5511 9692	Lot 2, Seksyen 13 Daerah Shah Alam Selangor.	4.20	05-11-2008
63	Dijaya Land Sdn. Bhd. Tropicana City Sdn. Bhd. Management Office, Lot B1-01, Basement 1 Tropicana City Mall, No. 3 Jalan SS20/27 47400 Petaling Jaya, Selangor. Tel : 03-7710 1818 Fax : 03-7710 0202	Tropicana City Lot 4582 Mukim Damansara Utama Daerah Petaling Jaya Selangor.	11.03	05-11-2008
64	GCH Retail (Malaysia) Sdn. Bhd. Giant Superstore Sandakan Lot 3, Jalan IJM, Bandar Utama Batu 6, Off Jalan Utara 90000 Sandakan, Sabah. Tel : 089-214 219 Fax : 089-214 207	Lot CL 075477584 Mukim Sandakan Daerah Sandakan, Sabah.	1.70	17-11-2008
65	BR Property Holdings Sdn. Bhd. Lot No. T117A, 3rd Floor Bangsar Shopping Centre 285 Jalan Maarof, Bukit Bandaraya 59000 Kuala Lumpur. Tel : 03-2094 7700 / 2094 1294 Fax : 03-2094 1022	Bangsar Shopping Centre Lot 41274 Daerah Kuala Lumpur Wilayah Persekutuan Kuala Lumpur.	8.51	18-11-2008
66	Dream Property Sdn. Bhd. 2-12, 2nd Floor Batu Pahat Mall, Jalan Kluang 83000 Batu Pahat, Johor. Tel : 07-433 7733 Fax : 07-438 7773	Batu Pahat Mall Lot 2566 Mukim Simpang Kanan Daerah Batu Pahat, Johor.	7.35	18-11-2008
67	AEON Co. (M) Bhd. AEON Bukit Indah Shopping Centre 1st Floor, No. 8, Jalan Indah 15/2 Bukit Indah, 81200 Johor Bahru, Johor. Tel : 07-236 8071 Fax : 07-236 8076	AEON Nusajaya Lot PTD 90606 Mukim Pulai Daerah Johor Bahru, Johor.	8.00	26-11-2008

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68	TESCO Stores (M) Sdn. Bhd. (Melaka Branch), No. 1 Jalan Tun Abdul Razak 74500 Peringgit, Melaka. Tel : 06-288 2000 Fax : 06-288 3078	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 Area XXXII Daerah Melaka Tengah 75400 Melaka.	3.01	26-11-2008
69	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Klang Lot 83191 & 83192, Persiaran Batu Nilam Bandar Bukit Tinggi 1 41200 Klang, Selangor. Tel : 03-3323 5518 Fax : 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
70	Tanah Sutera Development Sdn. Bhd. No. 2, Jalan Sutera Merah 2 Taman Sutera 81200 Johor Bharu. Tel : 07-289 9009 Fax : 07-289 9119	Kompleks Perniagaan Sutera Mall Lot Sebahagian PTD 67962 Mukim Pulai Daerah Johor Bharu, Johor.	5.98	03-12-2008
71	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Senawang Lot 1571 Jalan Senawang Taman Komersil Senawang 70450 Seremban, Negeri Sembilan. Tel : 06-678 0719 / 678 0720 Fax : 06-678 2360	Lot PT 1571 HS(D) 133690 Pekan Senawang Daerah Seremban Negeri Sembilan.	2.12	03-12-2008
72	Malaysia Airports Sdn. Bhd. Lapangan Terbang Sultan Ismail Petra 16100 Kota Bharu, Kelantan. Tel : 09-773 7400 Fax : 09-773 2852	Kompleks Lapangan Terbang Sultan Ismail Petra Lot 833 (Sek 40) Mukim Pengkalan Chepa Dan Lot 2209 (Sek 39) Mukim Baung Daerah Kota Bharu, Kelantan.	2.56	19-12-2008
73	GCH Retail (Malaysia) Sdn. Bhd. Giant Hypermarket Southern City Ground Floor, Southern City No. 3 Jalan Suria 19, Taman Suria 81100 Johor Bahru, Johor. Tel : 07-334 7214 Fax : 07-334 6762	Lot HS(D)247769 PTB 20274 Daerah Bandar Johor Bahru Johor.	1.95	14-01-2009
74	Permodalan Nasional Berhad 19th Floor, Menara Tun Ismail Mohamed Ali No. 25, Jalan Raja Laut 50350 Kuala Lumpur. Tel : 03-2694 2213 Fax : 03-2691 3791	Menara Tun Ismail Mohamed Ali Lot 1406 Mukim Bandar Kuala Lumpur Wilayah Persekutuan Kuala Lumpur.	5.95	04-02-2009

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75	AEON Co. (M) Bhd. AEON AU2 Shopping Centre (Setiawangsa) Lower Ground Floor No. 6 Jalan Taman Setiawangsa (Jln. 37/56) AU2, Taman Keramat, 54200 Kuala Lumpur. Tel : 03-4257 2533 Fax : 03-4257 2633	Lot PT 1019 (HSD 83614) Mukim Hulu Kelang Wilayah Persekutuan Kuala Lumpur.	3.89	16-02-2009
76	Ivory Gleneary Sdn. Bhd. (Ivory Times Square Sdn. Bhd.) 77-4B-1, Penang Times Square Jalan Dato Keramat 10150 George Town, Penang. Tel : 04-210 9020 Fax : 04-210 9021	Penang Times Square Lot 73, 96, 98, 101, 102, 145, 146, 150, 159, 160, 163, 278, 279, 735 Hingga 753 Dan 767 Seksyen 10, Georgetown 10150 Pulau Pinang.	15.80	16-02-2009
77	Bronze Towers Sdn. Bhd. No. B 60, First Floor Lorong Tun Ismail 5 25000 Kuantan, Pahang. Tel : 09-515 9303 Fax: 09-515 9304	Plaza Kuantan Lot PT 6727/12 Dan PT 6727/13 Mukim Kuala Kuantan Daerah Kuantan, Pahang.	2.50	16-02-2009
78	Magic Coast Sdn. Bhd. No. 5-8, Boulevard Mid Valley City Lingkaran Syed Putra, 59200 Kuala Lumpur. Tel : 03-2282 7295 / 2282 7297 Fax : 03-2282 7286	Lot 582, Mukim Jalan Tun Sambanthan, Seksyen 55 Daerah Kuala Lumpur Negeri Persekutuan Kuala Lumpur.	13.00	23-02-2009
79	Floral E-Joy Sdn. Bhd. No: 36A (1st Floor), Jalan Persiaran Flora Utama Taman Flora Utama, 83000 Batu Pahat, Johor. Tel : 07-432 7899 Fax : 07-432 6899	Square 1, Lot PTD 48031 Mukim Simpang Kanan Daerah Batu Pahat, Johor.	1.99	25-02-2009
80	Legend Advance Sdn. Bhd. M - IOI, Jalan Alor Bukit, Taman Legenda Putra 81000 Kulai, Johor. Tel : 07-662 6101 / 599 9929 Fax : 07-662 2510	IOI Mart, Lot 5592 – 5595 Mukim Senai Daerah Kulai, Johor.	0.92	12-03-2009
81	MSL Properties Sdn. Bhd. Wangsa Walk Mall Management Office Lot G93A, Wangsa Walk Mall, Wangsa Avenue 9, Jalan Wangsa Perdana 1 Bandar Wangsa Maju, 53300 Kuala Lumpur. Tel : 03-4142 8888 / 4142 8890 Fax : 03-4149 7441	Wangsa Walk Mall Lot PT 8282 (HSD 111811) Mukim Setapak Daerah Kuala Lumpur Wilayah Persekutuan.	8.63	20-03-2009
82	Salak Park Sdn. Bhd. No. 3-1-1, Block A, Megan Salak Park Jalan 2/125E, Taman Desa Petaling 57100 Kuala Lumpur. Tel : 03-9057 5733 Fax : 03-9058 7481	Lot No. 38606 Dan 38603 Taman Desa Petaling Mukim Petaling Daerah Wilayah Persekutuan 57100 Kuala Lumpur.	2.27 *	27-04-2009

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83	Tenaga Nusantara Sdn. Bhd. Lot 2-18, 2nd Floor, Kluang Mall, Jalan Rambutan Bandar Kluang, 86000 Kluang, Johor. Tel : 07-776 1240 Fax : 07-776 1202	Lot 6113 Mukim Bandar Kluang Daerah Kluang 86000 Johor.	4.50	13-05-2009
84	Technology Park Malaysia Corporation Sdn. Bhd. 5th Floor, Enterprise 4 Lebuhraya Puchong - Sg. Besi 57000 Bukit Jalil, Kuala Lumpur. Tel : 03-8998 2260 Fax : 03-8998 2226	Taman Teknologi Malaysia Lot PT 5517, Mukim Petaling Daerah Kuala Lumpur Wilayah Persekutuan.	4.65	18-05-2009
85	1st Avenue Mall Sdn. Bhd. Centre Management Office, 5th Floor 1st Avenue, 182, Jalan Magazine, 10300 Penang. Tel : 04-261 1121 Fax : 04-263 1121	Lot 386, Mukim Seksyen 17 Daerah Georgetown Pulau Pinang.	6.08	22-05-2009
86	Mydin Mohamed Holdings Bhd. Mydin Subang Jaya Mall Lot 675 & 676, Persiaran Subang Permai USJ 1, 47500 Subang Jaya, Selangor. Tel : 03-8073 6000 Fax : 03-8073 6395 / 8023 8059	Mydin Wholesale Hypermarket Lot 675 & 676 Mukim Damansara Daerah Petaling Jaya, Selangor.	5.62	02-06-2009
87	TESCO Stores (Malaysia) Sdn. Bhd. TESCO Seri Alam Lot PTD 111515, Jalan Seri Alam Bandar Seri Alam, 81750 Masai, Johor. Tel : 07-388 5164 Fax : 07-388 6709	TESCO Seri Alam Lot PTD 111515 Mukim Plentong Daerah Johor Bharu, Johor.	3.40	16-06-2009
88	TESCO Stores (Malaysia) Sdn. Bhd. No.3 Jalan Batu Nilam 6/KS 6 Bandar Bukit Tinggi, 41200 Klang, Selangor. Tel : 03-3323 1100 Fax : 03-3323 8802	TESCO Kelang Lot 83595, Mukim Pekan Pandamaran Daerah Kelang, Selangor.	3.40	16-06-2009
89	TESCO Stores (Malaysia) Sdn. Bhd. 148-149, Pusat Bandar Puchong Jalan Bandar Off Jalan Puchong 47100 Puchong, Selangor. Tel : 03-8076 2166 Fax : 03-8076 1525	TESCO Puchong Lot PT 2, Mukim Pekan Desa Puchong, Daerah Petaling Selangor.	3.40	16-06-2009
90	TESCO Stores (Malaysia) Sdn. Bhd. TESCO Ipoh, No. 2, Jalan Jambu Taman Teh Teng Seng, 31400 Ipoh, Perak. Tel : 05-546 3352 Fax : 05-548 4159	TESCO Ipoh Lot PT 217003 Mukim Hulu Kinta Daerah Kinta, Perak.	3.40	16-06-2009
91	TESCO Stores (Malaysia) Sdn. Bhd. Lot 37820 & 11196 Mukim Kajang Saujana Impian 43000 Kajang, Selangor. Tel : 03-8734 1369 Fax : 03-8734 1297	TESCO Kajang , Lot PT 37820 Mukim Kajang & Lot PT 66452 & 44628, Seksyen 9 Mukim Bandar Kajang Daerah Ulu Langat, Selangor.	3.40	16-06-2009

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92	Kumpulan Wang Simpanan Pekerja Jabatan Pengurusan Harta Tingkat 14, Bangunan KWSP Jalan Raja Laut, 50350 Kuala Lumpur. Tel : 03-2694 7566 Fax : 03-2693 8704	Lot PT 144258 Bandar Ipoh Daerah Kinta, Perak.	2.44	16-06-2009
93	See Sen Chemical Bhd. PT 3940, Kawasan Perindustrian Teluk Kalong 24000 Kemaman, Terengganu. Tel : 09-863 2142 / 863 2304 Fax : 09-863 2143	Malay-Sino Chemical Industries Sdn. Bhd. Lot 2989, 3558, 3557 & 4524 Mukim Teluk Kalong Daerah Kemaman, Terengganu.	6.00 **	17-06-2009
94	Crest Worldwide Resources Sdn. Bhd. Wisma SKN, No. 5, Persiaran Lidco 1 Off Jalan Yap Kwan Seng 50450 Kuala Lumpur. Tel : 03-2162 1929 Fax : 03-2162 0929	Lot 134, PT 32, Seksyen 44 Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur Wilayah Persekutuan.	7.00 *	17-06-2009
95	IJM Biofuel Sdn. Bhd. (IJM Edible Oils Sdn. Bhd.) Wisma IJM Plantations, Lot 1 Jalan Bandar Utama, Batu 6, Jalan Utara 90000 Sandakan, Sabah. Tel : 089-667 721 Fax : 089-674 810	IJM Edible Oils Sdn. Bhd. IJM Integrated Downstream Processing Complex Lot Nt. 073019299 Mukim Sungai Mowtas Daerah Sandakan Poskod 90009, Sabah.	4.50 *	18-06-2009
96	Westports Malaysia Sdn. Bhd. P.O. Box 266, Pulau Indah 42009 Port Klang, Selangor. Tel : 03-3169 4000 Fax : 03-3169 4101	Lot PT 65746 Mukim Klang, Daerah Klang Selangor.	83.00	26-06-2009
97	TESCO Stores (Malaysia) Sdn. Bhd. TESCO Extra Ipoh, No. 2, Laluan Tasek Timur 6 Taman Tasek Indra, Off Jalan Kg. Bercham 31400 Ipoh, Perak. Tel : 05-549 9200 Fax : 05-545 7698	TESCO Extra Ipoh Lot PT 128421 Mukim Hulu Kinta Daerah Kinta, Perak.	2.76	02-07-2009
98	TESCO Stores (Malaysia) Sdn. Bhd. Ground Floor, Aim Point Plaza Jalan Emas 15, Bandar Sungai Emas 42700 Banting, Selangor. Tel : 03-3187 2909 Fax : 03-3187 2141	TESCO Banting, Ground Floor, Aim Point Plaza Bandar Sungai Emas Mukim Tanjung Dua Belas 42700 Banting, Selangor.	1.30	02-07-2009
99	TESCO Stores (Malaysia) Sdn. Bhd. TESCO Extra Sungai Dua No. 657, Jalan Sungai Dua, Sungai Dua 11700 Sungai Dua, Pulau Pinang. Tel : 04-656 9888 Fax : 04-659 1188	TESCO Extra Sungai Dua Lot 10252, Mukim 13 Daerah Timur Laut (DTL) Jalan Sungai Dua, Pulau Pinang.	1.70	02-07-2009

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100	TESCO Stores (Malaysia) Sdn. Bhd. No 1, Persiaran Sukan Seksyen 13 Peti Surat 7427, 40714 Shah Alam, Selangor. Tel : 03-5512 2600 Fax : 03-5510 2305	TESCO Extra Shah Alam Lot 1107 Mukim Bandar Shah Alam Daerah Petaling, Selangor.	2.98	02-07-2009
101	TESCO Stores (Malaysia) Sdn. Bhd. No. 2, Jalan Midah 2, Taman Midah 56000 Cheras, Kuala Lumpur. Tel : 03-9133 5100 Fax : 03-9132 3641	TESCO Extra Cheras Lot PT 4476 Daerah Kuala Lumpur Wilayah Persekutuan.	2.98	02-07-2009
102	TESCO Stores (Malaysia) Sdn. Bhd. Kawasan Perindustrian Oakland 70300 Seremban 2, Negeri Sembilan. Tel : 06-762 3227 Fax : 06-762 3241	TESCO Extra Seremban Lot PT 452, Pekan Bukit Kepayan Daerah Seremban Negeri Sembilan.	2.13	02-07-2009
103	MRCB Selborn Corporation Sdn. Bhd. (MRCB Central Properties Sdn. Bhd.) Lot 402 & 433, Level 4, Plaza Alam Sentral Jalan Majlis 14/10, Seksyen 14 Shah Alam, 40000 Selangor. Tel : 03-2786 8120 Fax : 03-5032 0023	Plaza Alam Sentral Lot 58, Seksyen 14 Mukim Bandar Shah Alam Daerah Petaling, Selangor.	11.00	08-07-2009
104	GCH Retail (Malaysia) Sdn. Bhd. Giant Complex Tawau, CL105466055 KM 5 , Jalan Chong Thien Vun Off Jalan Apas, 91000 Tawau, Sabah. Tel : 089-911 890 Fax : 089-911 891	Giant Hypermarket Lot CL 105466055 Jalan Datuk Chong Fuen Yun 91000 Tawau, Sabah.	3.00	10-07-2009
105	Malaysia Airports Sdn. Bhd. Lapangan Terbang Antarabangsa Langkawi 07100 Padang Mat Sirat, Langkawi, Kedah. Tel : 04-955 1311 / 955 1312 Fax : 04-955 1314	Lapangan Terbang Antarabangsa Langkawi TK1 Mukim Bohor & TK2 Mukim Padang Mat Sirat & TK3, TK4 Mukim Kedawang Daerah Langkawi, Kedah.	2.29	17-07-2009
106	Amtrustee Berhad Hektar Black Sdn. Bhd. Lot B02, Mahkota Parade No. 1, Jalan Merdeka, 75000 Melaka. Tel : 06-282 6151 Fax : 06-282 7305	Mahkota Parade Lot PT 487 Mukim Melaka Tengah Daerah Melaka, Melaka.	10.80	17-07-2009
107	Malaysia Airports Sdn. Bhd. Lapangan Terbang Sultan Ahmad Shah 25150 Kuantan, Pahang. Tel : 09-531 2150 Faks : 09-538 4017	Lapangan Terbang Sultan Ahmad Shah Lot PT 86418 Mukim Kuala Kuantan Daerah Kuantan, Pahang.	0.33	17-07-2009

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108	Malaysia Airports Sdn. Bhd. Lapangan Terbang Antarabangsa Pulau Pinang 11900 Bayan Lepas, Pulau Pinang. Tel : 04-643 4411 Fax : 04-643 5399	Lapangan Terbang Antarabangsa Pulau Pinang Lot 7565 Dan PT 230, 231, 232, 228, 229, 3096, 1610, TK1 Dan TK2, Mukim 12, Daerah Barat Daya, Pulau Pinang.	4.00	17-07-2009
109	ABI Construction Sdn. Bhd. No. 332A, Lorong Serawak Melawati Urban 1, Pusat Bandar Melawati 53100 Kuala Lumpur. Tel : 03-4147 3733 Fax : 03-4147 4733	Plaza Paya Bunga, Lot PT 3073K Bandar Kuala Terengganu Daerah Kuala Terengganu Terengganu.	3.83	31-07-2009
110	Makamewah Sdn. Bhd. 9th Floor, 9-3, Suria Sabah Shopping Mall 1, Jalan Tun Fuad Stephens 88000 Kota Kinabalu, Sabah. Tel : 088-238 949 Fax : 088-239 040	Suria Sabah Shopping Mall Lot TL 017539810 Mukim Kota Kinabalu Daerah Kota Kinabalu, Sabah.	13.00	27-08-2009
111	Pembinaan Titis Jaya Sdn. Bhd. TJ Mart, Lot 5035, Batu 17 Jalan Air-Hitam, Saleng, 81400 Senai, Johor. Tel : 07-598 4323 Fax : 07-598 5323	TJ Mart, Lot 5035 Mukim Kulai, Daerah Kulaijaya Johor.	0.55	11-09-2009
112	Mydin Mohamed Holdings Bhd. Mydin Melaka Hypermarket, Lot 15060, 15061 & 15062, Mukim Bukit Katil, Melaka Tengah 75450 Ayer Keroh, Melaka. Tel : 06-231 3007 Fax : 06-231 3070	Mydin Wholesale Hypermarket MITC Melaka, Lot 15060, 15061 & 15062, Mukim Bukit Katil Daerah Melaka Tengah, Melaka.	4.30	14-09-2009
113	Kuantan Port Consortium Sdn. Bhd. Wisma KPC, KM 25, Tanjung Gelang P.O. Box 199, 25720 Kuantan, Pahang. Tel : 09-586 3888 Fax : 09-586 3777	Kuantan Port Lot 1863, Mukim Sungai Karang Daerah Kuantan, Pahang.	3.49	05-10-2009
114	Shell Refining Company (Federation of Malaya) Bhd. Batu 1, Jalan Pantai 71000 Port Dickson, Negeri Sembilan. Tel : 06-647 1311 Fax : 06-647 4622	71000 Port Dickson Negeri Sembilan.	35.00 **	05-10-2009
115	AEON Co. (M) Bhd. AEON Bandaraya Melaka Shopping Centre 1st Floor, Management Office No. 2, Jalan Lagenda Taman 1 - Lagenda, 75400 Melaka. Tel : 06-281 6398 / 282 9389 Fax : 06-281 6398	Jusco Shopping Mall Lot PT 1 Kawasan Bandar 32 Dan PT 69, Kawasan Bandar 33 Daerah Melaka Tengah, Melaka.	22.50	05-10-2009
116	Couture Homes Sdn. Bhd. A-12-02, Empire Office, Empire Subang Jalan SS 16/1, 47500 Subang Jaya, Selangor. Tel : 03-5638 9888 Fax : 03-5631 9886	Lot 6 Dan PT 20912 Mukim Bandar Subang Jaya Daerah Petaling, Selangor.	8.67	22-12-2009

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117	IOI Bio-Energy Sdn. Bhd. Two IOI Square, IOI Resort 62502 Putrajaya. Tel : 03-8947 8888 Fax : 03-8943 2266 / 8947 8800	IOI Edible Oils Sdn. Bhd. IOI Integrated Edible Oils Processing Complex Mukim Sungai Mowtas Daerah Sandakan Poskod 90738, Sabah.	15.00 *	20-01-2010
118	Kumpulan Wang Simpanan Pekerja Jabatan Pengurusan Harta, Tingkat 14 Bangunan KWSP, Jalan Raja Laut, 50350 Kuala Lumpur. Tel : 03-2616 2269 Fax: 03-2693 8704	Lot 842, Seksyen 14 Mukim Bandar Georgetown Daerah Timur Laut Pulau Pinang.	3.40	25-01-2010
119	TSH Bio-Gas Sdn. Bhd. Bangunan TSH, TB 9, KM 7, Apas Road 91000 Tawau, Sabah. Tel : 089-912 020 / 911 056 Fax : 089-913 000	Lot CL 105392989 Mukim Kalumpang Daerah Tawau 91000 Sabah.	3.00 **	11-03-2010
120	Seh Power Sdn. Bhd. Lot 1 (DBKK No. 1.1), 1st Floor Wisma Kolombong, Jalan Kolombong Mile 5 1/2, Off Jalan Tuaran 88450 Kota Kinabalu, Sabah. Tel : 088-426 322 Fax : 088-424 215	Sandakan Education Hub Lot 01 - 25 Mukim Sungai Batang Daerah Sandakan, Sabah.	45.00	11-03-2010
121	Felda Engineering Services Sdn. Bhd. Tingkat 6, Balai Felda, Jalan Gurney Satu 54000 Kuala Lumpur. Tel : 03-2693 5211 Fax : 03-2693 6717	Gugusan Felda Umas Umas 1, 2, 3 & 4, Mukim Umas Daerah Tawau, Sabah.	2.60 **	31-03-2010
122	Felda Engineering Services Sdn. Bhd. Tingkat 6, Balai Felda Jalan Gurney Satu, 54000 Kuala Lumpur. Tel : 03-2693 5211 Fax : 03-2693 6717	Gugusan Felda Sahabat Lot Sahabat 01-54 Mukim Sahabat Daerah Lahad Datu, Sabah.	23.94 **	31-03-2010
123	Felda Engineering Services Sdn. Bhd. Tingkat 6, Balai Felda Jalan Gurney Satu, 54000 Kuala Lumpur. Tel : 03-2693 5211 Fax : 03-2693 6717	Gugusan Felda Kalabakan Kalabakan Tengah 01 & 02, Kalabakan Utara Dan Kalabakan Selatan Mukim Kalabakan Daerah Tawau, Sabah.	1.55 **	31-03-2010
124	Ipoh Tower Sdn. Bhd. Unit No. 2 FO-1, Ipoh Tower Jalan Dato' Seri Ahmah Said Greentown, 30450 Ipoh, Perak. Tel : 05-241 4662 Fax : 05-242 4563	Complex Ipoh Tower Sdn. Bhd. Lot 23628 Mukim Bandar Ipoh (S) & 23629, 8701U, 9570U Mukim Bandar Ipoh (U) Daerah Kinta, Perak.	4.25	03-05-2010
125	Untung Ria Sdn. Bhd. 11th Floor, Wisma Perindustrian Jalan Istiadat, Likas, 88400 Kota Kinabalu, Sabah. Tel : 088-242 257 Fax: 088-242169	Lot No. CL 135193752 dan CL 135366139, Kg. Ulu Patikang Keningau, Sabah.	4.00 **	09-08-2010

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*
126	C3 Power Sdn. Bhd. 2nd Floor, U0271, Block F, Jati Commercial Centre P.O. Box 80737, 87017 Wilayah Persekutuan Labuan. Tel : 087-411 175 Fax : 087-419 731	Temporary Settlement in Some Areas in W. Persekutuan Labuan Daerah Kota Kinabalu and Sandakan, Sabah.	5.85	26-08-2010
127	Jasa Imani Sdn. Bhd. No. 4, Ground Floor Jalan Putra Square 1, Putra Square 25200 Kuantan, Pahang. Tel : 09-515 9595 Fax : 09-515 9597	Menara Pejabat Putra Square Lot 423, Seksyen 20 (PN5596) Jalan Bukit Sekilau Bandar Kuantan, Pahang.	4.25	27-09-2010
128	Suara Wira Sdn. Bhd. Ground Floor, Lot 3, Blk. E Donggongan New Township Penampang, 89500 Kota Kinabalu, Sabah. Tel : 088-712 792 Fax : 088-710 792	Lot TL 217501874 & TL 217502086 Mukim Donggongan New Township Daerah Penampang, Sabah.	4.05	27-09-2010
129	Malaysia Airports Sdn. Bhd. Lapangan Terbang Antarabangsa Kota Kinabalu Aras 5, Bangunan Terminal, Beg Berkunci 134 88740 Kota Kinabalu, Sabah. Tel : 088-325 555 Fax : 088-325 511	Lapangan Terbang Antarabangsa Kota Kinabalu Lot PT 92010207, TK 1, TK 2 & TK 3, Mukim Kota Kinabalu Dan PT 92210081 Mukim Penampang Daerah Kota Kinabalu, Sabah.	5.50	03-11-2010
130	Malaysia Airports Sdn. Bhd. Lapangan Terbang Tawau P.O. Box 60132, 91011 Tawau, Sabah. Tel : 089-950 777 Fax : 089-950 781	Lapangan Terbang Tawau Lot TK 1, Mukim Apas Balong Daerah Tawau, Sabah.	2.50	03-11-2010
131	Malaysia Airports Sdn. Bhd. Lapangan Terbang Sandakan P.O. Box 730, 90009 Sandakan, Sabah. Tel : 089-667 784 Fax : 089-667 778	Lapangan Terbang Sandakan Lot TK 1 Mukim Sandakan Daerah Sandakan, Sabah.	2.50	03-11-2010
132	Sepang Goldcoast Sdn. Bhd. No. 30B 1st & 2nd Floor, Jalan Pekedai U1/36 Section U1, Hicom Glenmarie Industrial Park 40150 Shah Alam, Selangor. Tel : 03-5569 0800 Fax : 03-5569 0900 / 5569 2488	Lot PT 5247 (PKT 67) Pantai Bagan Lalang, Mukim Sepang Daerah Sepang, Selangor.	9.50 **	13-12-2010
133	Sunway Pyramid Sdn. Bhd. Level CP6, Blue Atrium, Sunway Pyramid Shopping Mall, No. 3, Jalan PJS 11/15, Bandar Sunway 46150 Petaling Jaya, Selangor. Tel : 03-7494 3000 Fax : 03-7492 6333 *(Licence Transferred to OSK Trustees Berhad on 28/11/2011)*	Sunway Pyramid Shopping Centre PT 161, Lot 32 Dan Lot 51175 Bandar Sunway 47400 Petaling Jaya, Selangor.	22.00	22-12-2010
134	Setia Haruman Sdn. Bhd. (Property Management Department) The Lodge, Persiaran Multimedia, Cyber 7 63000 Cyberjaya, Selangor. Tel : 03-8312 8000 Fax : 03-8312 8077	The Lodge Persiaran Multimedia, Cyber 7 63000 Cyberjaya, Selangor.	15.50	22-12-2010

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*
135	GCH Retail (Malaysia) Sdn. Bhd. Giant Superstore Lukut Complex Management Office Lot 12532, Jalan Dataran Segar Bandar Dataran Segar, Batu 3, Jalan Port Dickson 71010 Port Dickson, Negeri Sembilan. Tel : 06-651 2012 Fax : 06-651 2011	Giant Superstore Lukut Complex Lot No. 12532 (Old Lot 1058) Mukim Port Dickson Daerah Port Dickson Negeri Sembilan.	2.55	22-12-2010
136	MTBE Malaysia Sdn. Bhd. Lot 111/112, Kawasan Perindustrial Gebeng P.O. Box 1, Balok, 26080 Kuantan, Pahang. Tel : 09-585 6778 / 585 6700 Fax : 09-585 6751 / 585 4090	Polypropylene Malaysia Sdn. Bhd. (PMSB) Mukim Gebeng, Daerah Kuantan 26080 Kuantan, Pahang.	40.00	24-12-10
137	Sun Victory Sdn. Bhd. Unit A5-UG1-01, Block A5, Solaris Dutamas No. 1, Jalan Dutamas 1, 50480 Kuala Lumpur. Tel : 03-6207 9426 Fax : 03-6207 9427	No. 1, Jalan Dutamas 1 50480 Kuala Lumpur.	5.08	18-01-2011
138	Aston Villa Sdn. Bhd. 33-1-1 Villa Scott, Brickfield 50470 Kuala Lumpur. Tel : 03-2381 7777 Fax : 03-2381 8010	Lot 1810 (PT 3717 & PT 3718) Jalan Kelang Lama 58200 Kuala Lumpur.	5.41	29-04-2011
139	Amtrustee Berhad Capitamalls Malaysia Trust 170-06-01, Plaza Gurney Persiaran Gurney, 10250 Penang. Tel : 04-222 8222 Fax : 04-228 6666	No. Lot 2903, Mukim Seksyen 1 Daerah Timur Laut 10250 Pulau Pinang.	22.50 *	29-04-2011
140	Festival City Sdn. Bhd. Level 5, Klang Parade, No. 2112, Jalan Meru 41050 Klang, Selangor. Tel : 03-3344 2882 / 3344 9889 Fax : 03-3344 2889	No. Lot 26220 Mukim Setapak 53300 Kuala Lumpur.	7.86 *	29-04-2011
141	Viva Mall Sdn. Bhd. Penthouse Corporate Suites, D-11-1 & 2 Level 13, Block D, Menara Uncang Emas (UE3), No. 85, Jalan Loke Yew, 55200 Kuala Lumpur. Tel : 03-9281 3888 Fax : 03-9281 8993	Lot PT 4 Section 91A Jalan Loke Yew 55200 Kuala Lumpur.	14.02	29-04-2011
142	AEON Co. (M) Bhd. AEON Mahkota Cheras Shopping Centre 1st Floor, Management Office Jalan Temenggung 21/9 Persiaran Mahkota Cheras 1 Bandar Mahkota Cheras 43200 Cheras, Selangor. Tel : 03-9080 3579 Fax : 03-9080 3580	Lot PT 47250 Mukim Cheras Daerah Hulu Langat 43200 Selangor.	3.5	29-04-2011
143	AEON Co. (M) Bhd. AEON Taman Equine Shopping Centre No. 2, Jalan Equine, Taman Equine Bandar Putra Permai 43300 Seri Kembangan, Selangor. Tel : 03-8945 2700 Fax : 03-8945 3700	AEON Taman Equine Shopping Mall No. Lot 53391 (PT 27427) Mukim Petaling Daerah Petaling, Selangor.	5.44	11-05-2011

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*
144	Jastamax Sdn. Bhd. Wisma Mah Sing, Penthouse Suite 2 No. 163, Jalan Sungai Besi 57100 Kuala Lumpur. Tel : 03-9221 6888 Fax: 03-9222 8380	Lot PT 657 Seksyen 92 Sungai Besi 57100 Kuala Lumpur.	2.72	26-05-2011
145	Upwell Shopping Complex (Segamat) Sdn. Bhd. No. 25 - 39, Jalan Syed Abdul Kadir 85000 Segamat, Johor. Tel : 07-932 8888 Fax : 03-932 4732	Lot PTD 6880 – 6894 Jalan Syed Abdul Kadir 85000 Segamat, Johor.	0.75	26-05-2011
146	ICSD Ventures Sdn. Bhd. Harbour Mall Sandakan Lot 54-55, First Floor, Block H-S 5 Sandakan Harbour Square 90000 Sandakan, Sabah. Tel : 089-213 351/213 352 Fax : 089-228 286	No. Lot TL 077579394 Daerah Sandakan, Sabah.	4.00 *	08-06-2011
147	Greenhill Resources Sdn. Bhd. Setia Alam Welcome Centre No. 2, Jalan Setia Indah AD/U13 1 AD, Setia Alam, Seksyen U13 40170 Shah Alam, Selangor. Tel : 03-3344 9949 Fax : 03-3344 3546	No. PT 26535, Mukim Bukit Raja Daerah Petaling, Selangor.	17.0 *	24-06-2011
148	Malaysia Airports Sdn. Bhd. Skypark Terminal Lapangan Terbang Sultan Abdul Aziz Shah 47200 Subang, Selangor. Tel : 03-7845 3245 Fax : 03-7846 3679	Lapangan Terbang Sultan Abdul Aziz Shah Complex, Lot 1210 & PT 46225 Mukim Sungai Buloh Dan Damansara Daerah Petaling, Selangor.	14.0	29-06-2011
149	Malaysia Airports Sdn. Bhd. Lapangan Terbang Sultan Mahmud 21300 Kuala Terengganu, Terengganu. Tel : 09-667 3666 / 662 4084 Fax : 09-662 6670	Lot 11467, PT 12716K, PT 12717K, PT 12718 Lapangan Terbang Sultan Mahmud, Terengganu.	1.6	29-06-2011
150	Malaysia Airports Sdn. Bhd. Lapangan Terbang Sultan Abdul Halim 06550 Alor Setar, Kedah. Tel : 04-714 2994 Fax : 04-714 5345	Lot TK 1, TK 2, TK 3, PT 230, 945, 824, 831, 828, 001061 Lapangan Terbang Sultan Abdul Halim, Kedah.	1.31	29-06-2011
151	Badan Pengurusan Bersama Riviera Bay Condominium B/P Badan Pengurusan Bersama Kondominium Riviera Bay P.O. Box 112, 75720 Melaka. Tel : 06-292 6700 Fax : 06-292 6700	Lot 134, 135, 136, 137, 292 & Sebahagian Lot 281 dan 133 Tanjung Keling, Melaka Tengah Melaka.	3.00	25-07-2011
152	GSL Development Sdn. Bhd. No. 16, Jalan Wan Kadir Taman Tun Dr. Ismail, 60000 Kuala Lumpur. Tel : 03-7726 6688 Fax : 03-7725 8285	No. Lot 51888 60000 Wilayah Persekutuan Kuala Lumpur.	6.42 *	27-07-2011

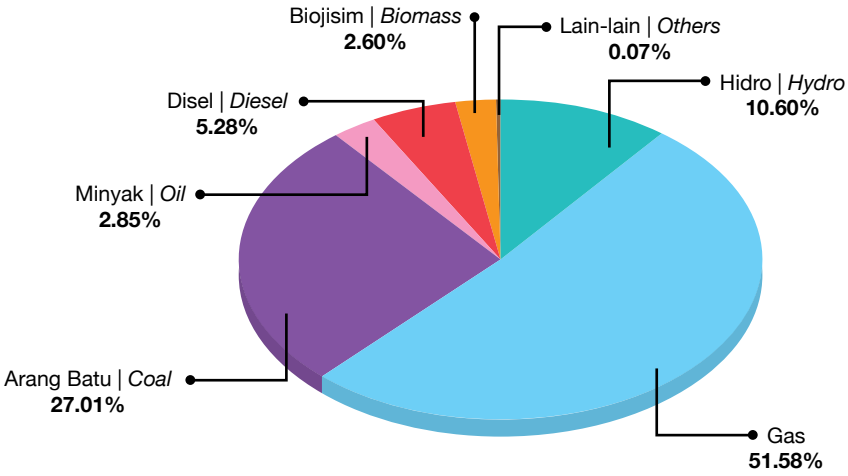
No.	Pemegang Lesen & Alamat Perhubungan *Licensee & Contact Address*	Kawasan Bekalan *Area of Supply*	Kapasiti Berlesen *Licensed Capacity (MW)*	Tarikh Lesen Dikeluarkan *Date of Licence Issued*
153	Perstima Utility Sdn. Bhd. PO Box 26, No. 255 Jalan Timah 3 Kawasan Perindustrian Pasir Gudang 81700 Pasir Gudang, Johor. Tel : 07-254 1200 Fax : 07-251 4618	Perstima Berhad No. Lot 00051694 Mukim Plentong Daerah Johor Bahru, Johor.	5.67 **	27-07-2011
154	Kenanga Whole Sale City Sdn. Bhd. Grand & Mezz Floor, No. 28, Jalan Gelugor Off Jalan Kenanga, 55200 Kuala Lumpur.	Lot 477, Jalan Merlimau Seksyen 69 55200 Kuala Lumpur.	14.45	04-08-2011
155	Plus Expressways Menara Korporat, Persada Plus Persimpangan Bertingkat Subang KM 15, Lebuhraya Baru Lembah Klang 47301 Petaling Jaya, Selangor. Tel : 03-7801 6666 / 7666 4666 Fax : 03-7801 6600	35 Locations Under Plus Expressways.	6.99	26-08-2011
156	AEON Co. (M) Bhd. Jusco Taman Maluri Shopping Centre 1st. Floor, Jalan Jejaka Taman Maluri, Cheras, 55100 Kuala Lumpur. Tel : 03-9285 5222 / 9200 1004 Fax : 03-9285 9999	Lot 33, 2386, 2595, 2596 Dan 2388, Taman Maluri Jalan Jejaka, Seksyen 90A Cheras, 55100 Wilayah Persekutuan K.L.	4.80	21-09-2011
157	AEON Co. (M) Bhd. Jusco Melaka Shopping Centre Leboh Ayer Keroh, 75450 Melaka. Tel : 06-232 4899 / 231 4929 Fax : 06-233 2988	Lot 4991 (PT 7041) Mukim Bukit Baru Daerah Melaka Tengah 75450 Melaka.	5.60	21-09-2011
158	AEON Co. (M) Bhd. Jusco Permas Jaya Shopping Centre No. 1, Jalan Permas Jaya Utara Bandar Baru Permas Jaya 81750 Johor Bahru, Johor. Tel : 07-386 0600 Fax : 07-386 1600	AEON Bandar Baru Permas Jaya Lot 147003, Zone 3-1 Mukim Permas Jaya 81750 Johor Bahru, Johor.	4.05	21-09-2011
159	CSF Advisers Sdn. Bhd. 3552 Jalan Teknokrat 6, 63000 Cyberjaya, Selangor. Tel : 03-8318 1313 Fax : 03-8318 0303	Lot PT 12125, Mukim Dengkil Daerah Sepang, 63000 Selangor.	6.80	18-10-2011
160	SF CX Sdn. Bhd. 7118, Jalan Impact, 63000 Cyberjaya, Selangor. Tel : 03-8318 1313 Fax : 03-8318 0303	Lot PT 12144 Dan Lot 12145 Mukim Dengkil, Daerah Sepang 63000, Selangor.	20.4	18-10-2011
161	Optimistic Organic Sdn. Bhd. Lot 3351, Teluk Kalong Industrial Estate 24007 Kemaman, Terengganu. Tel : 09-863 3029 Fax : 03-863 3085	Plot No. 4248 Teluk Kalong Industries Estate 24007 Kemaman, Terengganu.	7.0	20-10-2011

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*
162	Hunza Properties (Penang) Sdn. Bhd. 5-4-8/11, Hunza Complex, Jalan Gangsa Island Park, 11600 Penang. Tel : 04-659 6210 Fax : 04-657 2831	No. Lot 2960 (Plot A) Dan 2961 (Plot B), Mukim Seksyen 1 Daerah Timur Laut Pulau Pinang.	16.00	03-11-2011
163	AEON Co. (M) Bhd. AEON Ipoh Station 18 Shopping Centre No. 2, Susuran Stesen 18, Station 18 31650 Ipoh, Perak.	AEON Station 18 Lot 305553, 305554 & 305555 (PT 239099) Mukim Hulu Kinta Daerah Kinta, 31650 Perak.	16.00	03-11-2011
164	Amtrustee Berhad Capitamalls Malaysia Trust Box No. 228, Level 4 Centre Management Office The Mines, Jalan Dulang, Mines Resort City Seri Kembangan, 43300 Selangor. Tel : 03-8949 6288 Fax : 03-8949 6388	The Mines No. Lot PT 16722 Mukim Petaling Daerah Petaling 43300 Selangor.	10.00	22-11-2011
165	OSK Trustee Berhad 6th Floor, Plaza Osk Jalan Ampang 50450 Kuala Lumpur. Tel : 03-9207 7777 Fax : 03-2175 3288/3222 3223	Sunway Pyramid Shopping Centre PT 161, Lot 32 Dan Lot 51175 Bandar Sunway Petaling Jaya, Selangor.	22.0	28-11-2011

Nota I *Note:*
* Projek Pembangunan Belum Bermula I *Project Developments Have Not Commenced*
** Menjana & Mengagih Elektrik I *Generating & Distributing Electricity*

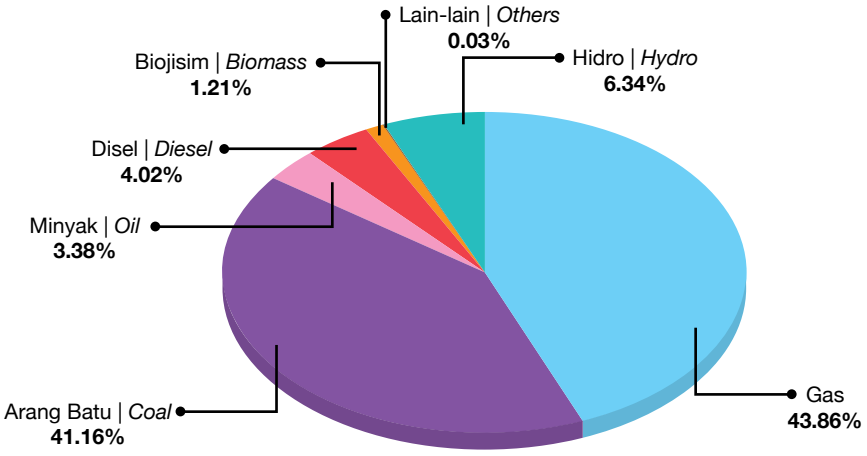
5. Ringkasan Industri Pembekalan Elektrik di Malaysia
Summary of Electricity Supply Industry in Malaysia

KAPASITI TERPASANG MENGIKUT JENIS BAHAN API
INSTALLED CAPACITY BY FUEL TYPE



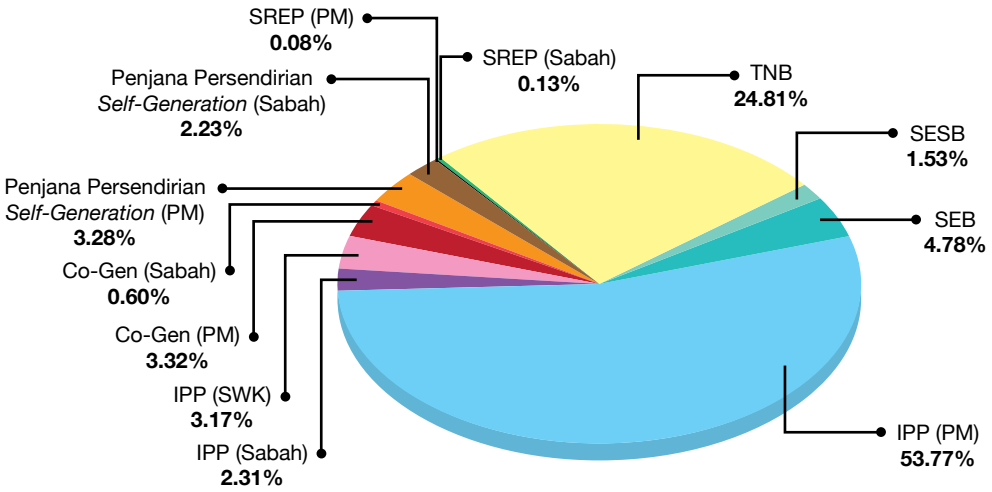
Jumlah Kapasiti Terpasang = 28,433 MW*
*Total Installed Capacity = 28,433 MW**

CAMPURAN PENJANAAN MENGIKUT JENIS BAHAN API
GENERATION MIX BY FUEL TYPE



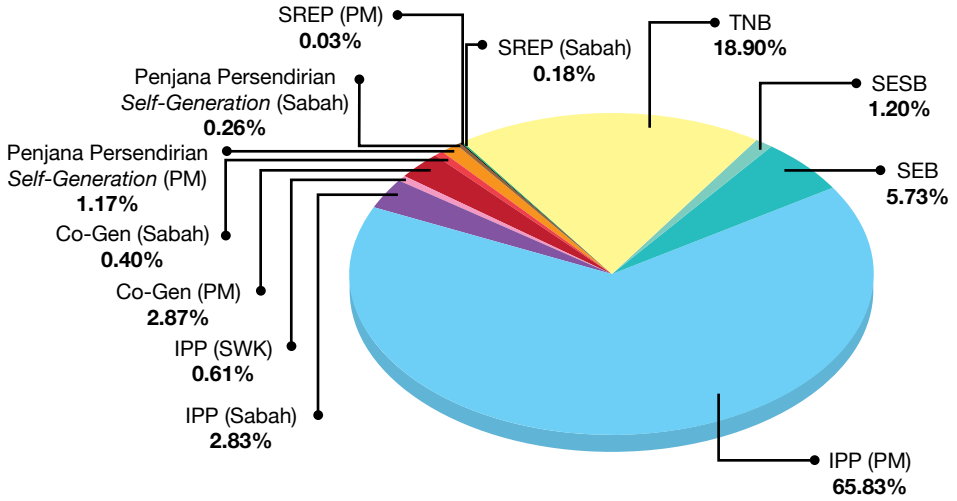
Jumlah Penjanaan Elektrik = 127,069 GWj**
*Total Electricity Generation = 127,069 GWh***

KAPASITI TERPASANG MENGIKUT PENJANA-PENJANA UTAMA
INSTALLED CAPACITY BY MAJOR POWER PRODUCERS



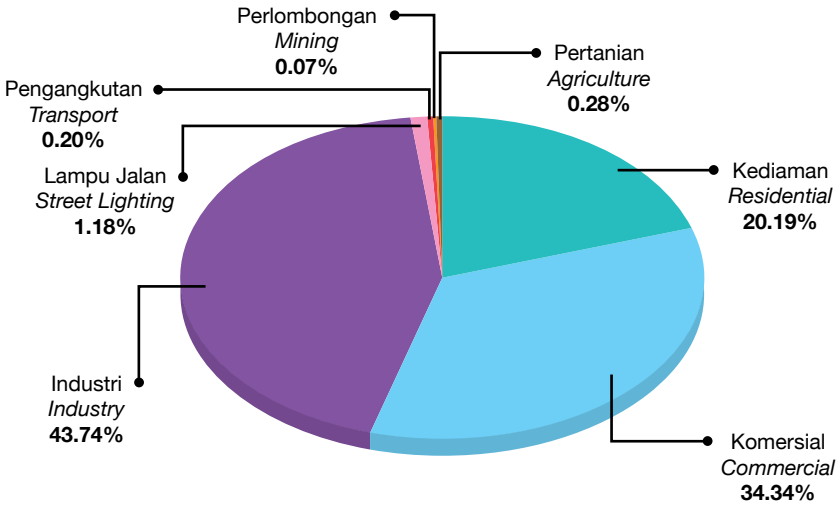
Jumlah Kapasiti Terpasang = 28,433 MW*
*Total Installed Capacity = 28,433 MW**

CAMPURAN PENJANAAN MENGIKUT PENJANA-PENJANA UTAMA
GENERATION MIX BY MAJOR POWER PRODUCERS



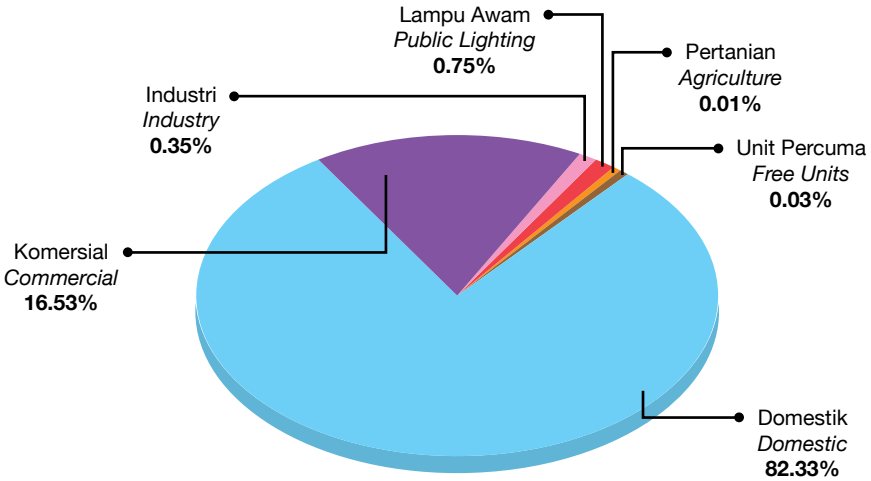
Jumlah Penjanaan Elektrik = 127,069 GWj**
*Total Electricity Generation = 127,069 GWh***

PENGGUNAAN TENAGA ELEKTRIK MENGIKUT SEKTOR
ELECTRICITY CONSUMPTION BY SECTOR



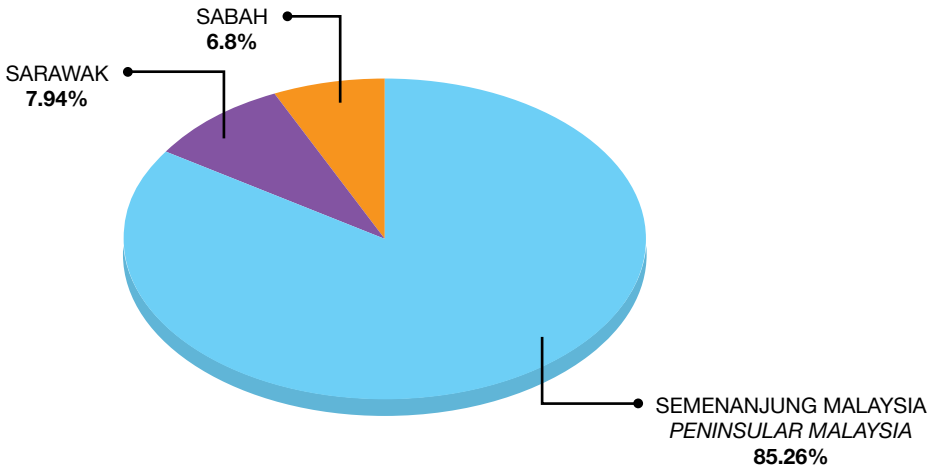
Jumlah Penggunaan Tenaga Elektrik = 107,330 GWj
Total Electricity Consumption = 107,330 GWh

BILANGAN PENGGUNA MENGIKUT SEKTOR
NUMBER OF CONSUMERS BY SECTOR



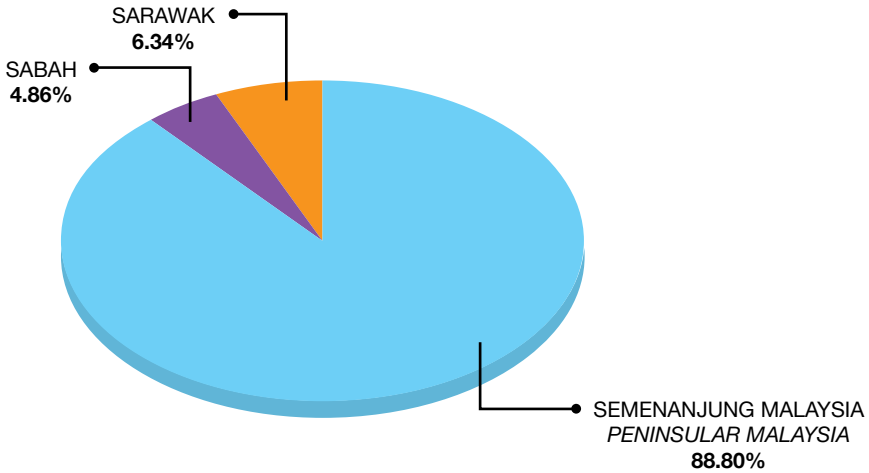
Jumlah Bilangan Pengguna = 8,648,650
Total Electricity Consumers = 8,648,650

JUMLAH KAPASITI TERPASANG DI MALAYSIA
TOTAL INSTALLED CAPACITY IN MALAYSIA



Jumlah Kapasiti Terpasang = 28,433 MW*
*Total Installed Capacity = 28,433 MW**

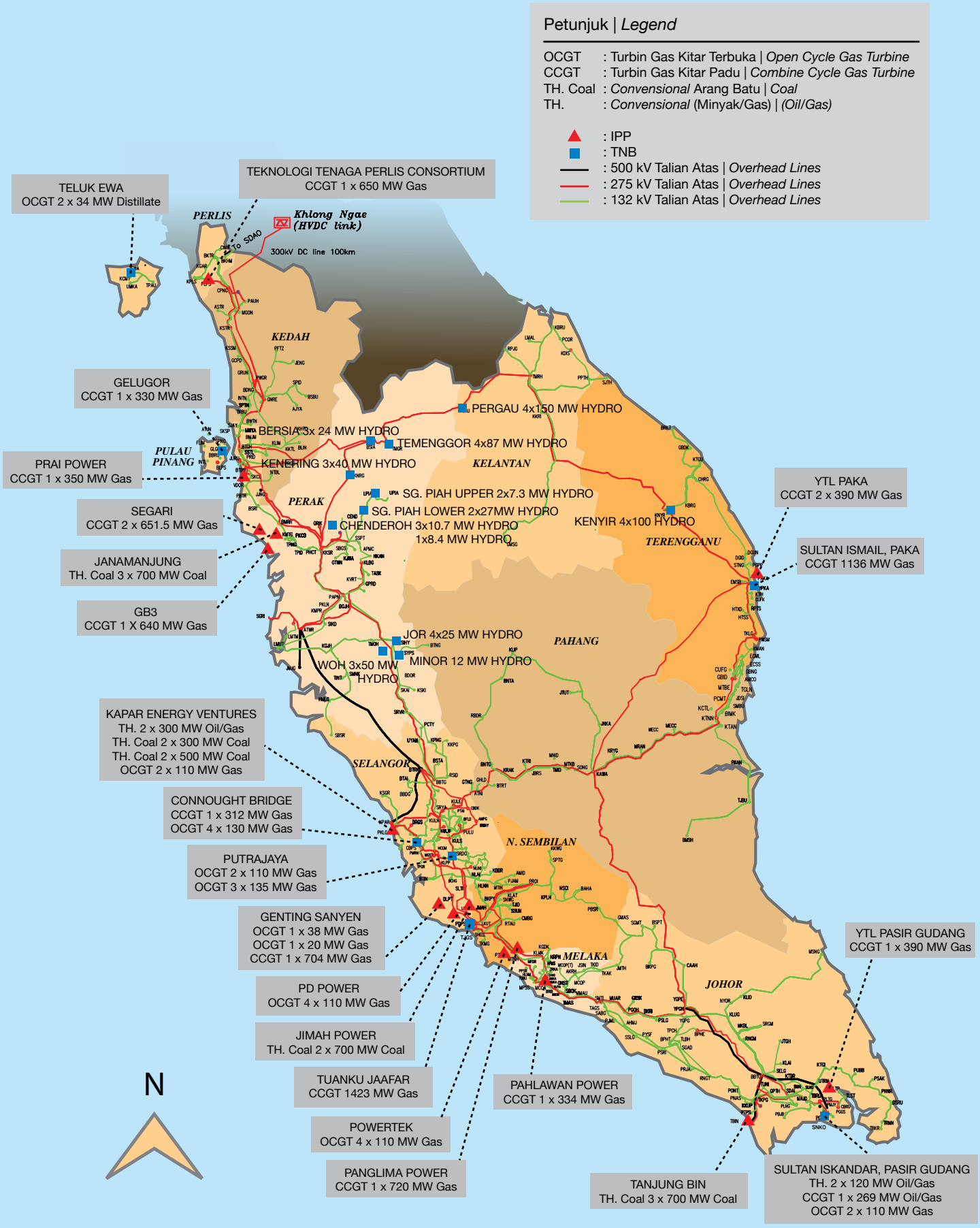
JUMLAH PENJANAAN ELEKTRIK DI MALAYSIA
TOTAL ELECTRICITY GENERATION IN MALAYSIA



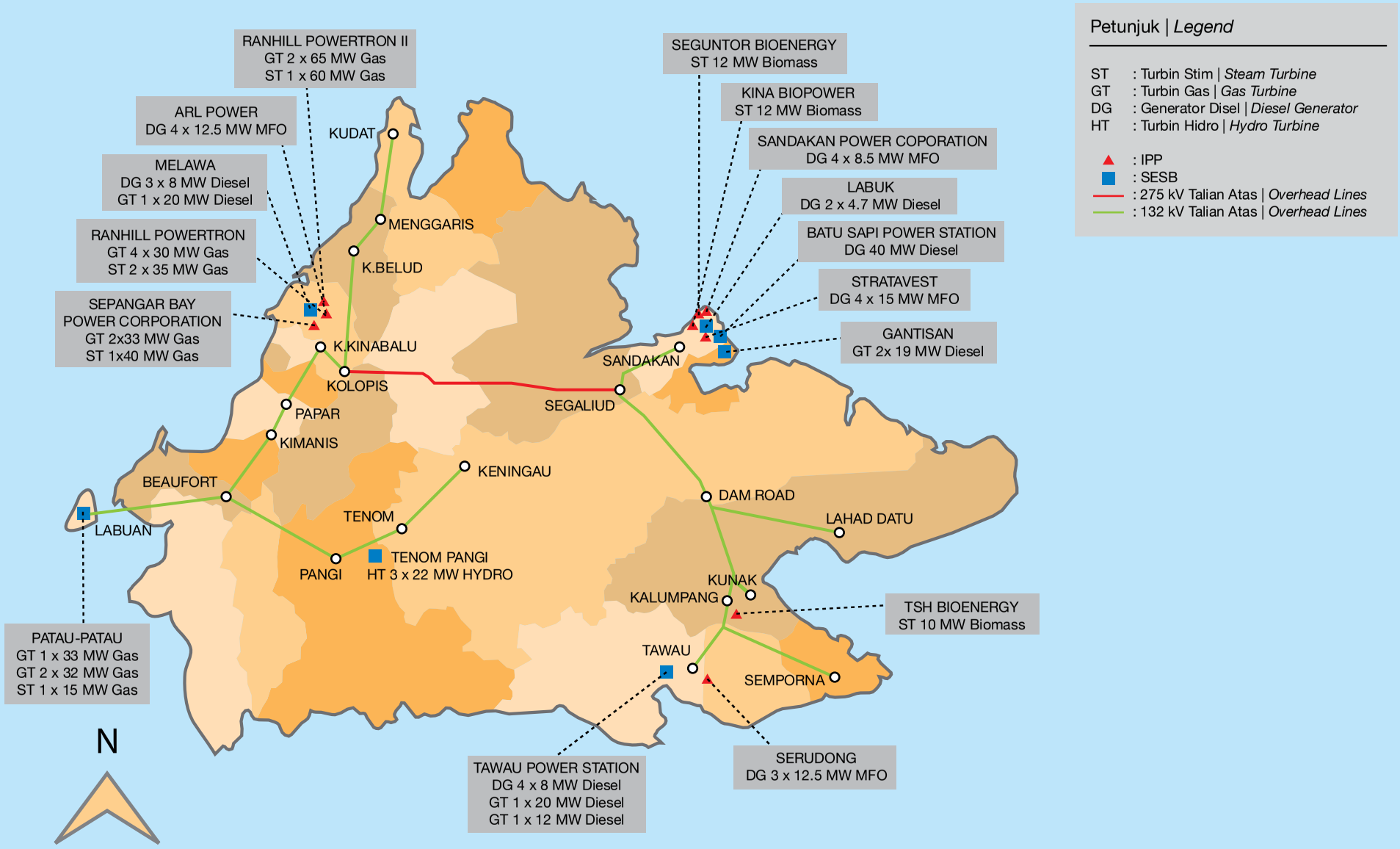
Jumlah Penjanaan Elektrik = 127,069 GWj**
*Total Electricity Generation = 127,069 GWh***

Nota I *Note:*
* Tidak termasuk Kapasiti Terpasang bagi *Co-Generation* dan Penjanaan Persendirian di Sarawak I *Excluding Installed Capacity for Co-Generation and Self-Generation in Sarawak*
** Tidak termasuk Jumlah Penjanaan bagi *Co-Generation* dan Penjanaan Persendirian di Sarawak I *Excluding Total Generation for Co-Generation and Self-Generation in Sarawak*

LOKASI STESEN JANA KUASA UTAMA DAN SISTEM GRID DI SEMENANJUNG MALAYSIA
LOCATION OF MAJOR POWER STATIONS AND GRID SYSTEM IN PENINSULAR MALAYSIA



LOKASI STESEN JANA KUASA UTAMA DAN SISTEM GRID DI SABAH
LOCATION OF MAJOR POWER STATIONS AND GRID SYSTEM IN SABAH



Petunjuk | *Legend*

ST : Turbin Stim | *Steam Turbine*
GT : Turbin Gas | *Gas Turbine*
DG : Generator Disel | *Diesel Generator*
HT : Turbin Hidro | *Hydro Turbine*

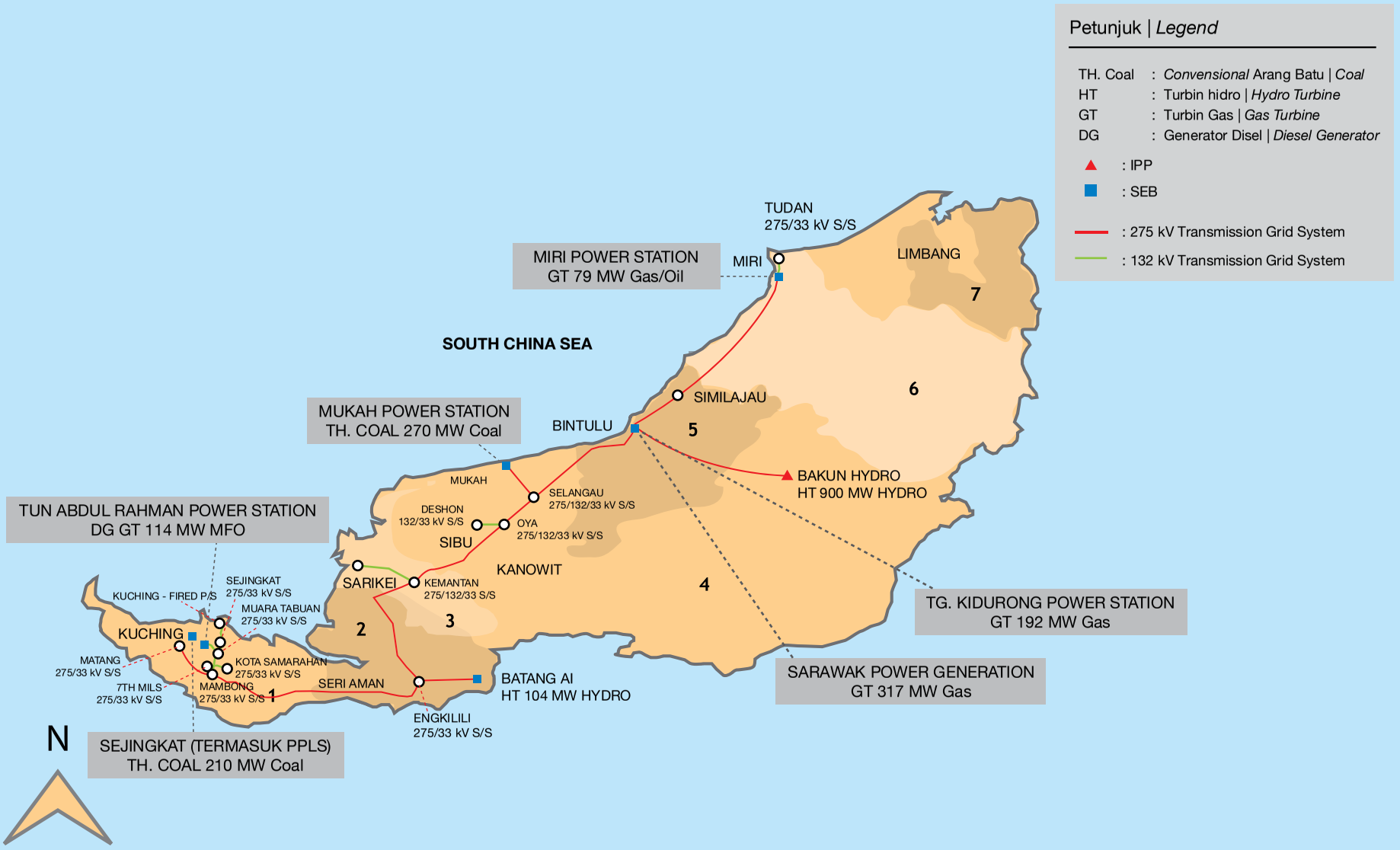
▲ : IPP
■ : SESB
— : 275 kV Talian Atas | *Overhead Lines*
— : 132 kV Talian Atas | *Overhead Lines*

Nota | *Note*:

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

- Stesen kecil | *small station* = 17.1 MW
- Mini hidro | *mini hydro* = 7.2 MW
- Stesen luar bandar | *rural station* = 2.6 MW

LOKASI STESEN JANA KUASA UTAMA DAN SISTEM GRID DI SARAWAK
LOCATION OF MAJOR POWER STATIONS AND GRID SYSTEM IN SARAWAK



Nota | *Note*:

1. Wilayah Barat | *Western Region*
2. Wilayah Sri Aman | *Sri Aman Region*
3. Wilayah Sarikei | *Sarikei Region*
4. Wilayah Tengah | *Central Region*
5. Wilayah Bintulu | *Bintulu Region*
6. Wilayah Utara | *Northern Region*
7. Wilayah Limbang | *Limbang Region*

NOTA
NOTE

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www.st.gov.my