Suruhanjaya Tenaga
Energy Commission

MAKLUMAT PRESTASI DAN STATISTIK INDUSTRI PEMBEKALAN ELEKTRIK DI MALAYSIA

PERFORMANCE AND STATISTICAL INFORMATION ON ELECTRICITY SUPPLY INDUSTRY IN MALAYSIA

2017

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SITUASI PEMBEKALAN DAN PERMINTAAN TENAGA ELEKTRIK

Permintaan tenaga elektrik di Semenanjung Malaysia pada tahun 2017 tidak menunjukkan peningkatan yang ketara jika dibandingkan dengan tahun 2016. Kehendak maksimum yang tertinggi untuk tahun 2017 direkodkan pada 23 Oktober 2017 iaitu sebanyak 17,790 MW, hanya 2 MW lebih tinggi daripada tahun 2016 (17,788 MW). Sehingga 31 Disember 2017, kapasiti terpasang di Semenanjung Malaysia ialah 24,138.93 MW dengan jumlah penjanaan elektrik sebanyak 123,128.20 GWj. Daripada jumlah ini, sebanyak 53.35% adalah elektrik yang dijana menggunakan arang batu, 40.59% daripada gas asli, 5.76% daripada hidro serta 0.30% daripada *medium fuel oil* (MFO) dan *distillate*.

Kapasiti terpasang di Semenanjung Malaysia terdiri daripada kapasiti penjanaan terpasang jana kuasa TNB dan jana kuasa IPP di mana kapasiti penjanaan terpasang IPP dilihat meningkat setiap tahun. Pada tahun 2017, kapasiti terpasang stesen jana kuasa IPP meningkat sebanyak 13.4% daripada 16,811.83 MW pada tahun 2016 kepada 19,071.83 manakala kapasiti terpasang TNB berkurangan sebanyak 17% dari 6,106.60 MW pada tahun 2016 kepada 5,067.10 MW. Kapasiti penjanaan terpasang IPP merangkumi 79% daripada jumlah kapasiti terpasang di Semenanjung Malaysia. Penambahan kapasiti IPP adalah daripada mulatugas loji penjanaan arang batu TNB Manjung Five (1,000 MW) dan loji CCGT Pengerang Power Sdn Bhd (400 MW) serta lanjutan loji YTL Paka (585 MW) dan loji CCGT TNB Pasir Gudang Sdn Bhd (275 MW).

Selain TNB dan IPP, penjanaan tenaga elektrik di Semenanjung Malaysia turut melibatkan stesen-stesen jana kuasa tenaga boleh diperbaharui termasuk hidro mini, *cogeneration* awam, *cogeneration* persendirian dan jana kuasa persendirian berkapasiti kurang daripada 5 MW yang tidak bersambung kepada sistem grid. Keseluruhan kapasiti terpasang daripada kategori ini adalah sebanyak 2,244.38 MW dan sebanyak 4,181.89 GWj tenaga elektrik telah dijanakan dalam tahun 2017 di mana 81.57% daripadanya adalah daripada sumber tenaga gas asli, 16.39% pula adalah daripada tenaga boleh diperbaharui seperti solar, biojisim, biogas dan hidro mini, serta bakinya daripada MFO, diesel dan lain-lain.

Pada ketika ini, pembekalan elektrik di Semenanjung Malaysia masih berada pada tahap yang selesa di mana margin rizab sistem pada tahun 2017 adalah dalam lingkungan 36%.

SITUATION OF ELECTRICITY SUPPLY AND DEMAND

The demand for electricity in Peninsular Malaysia in 2017 did not show a significant increase compared to 2016. The highest maximum demand for 2017 was recorded on 23 October 2017 at 17,790 MW which was only 2 MW higher than 2016 (17,788 MW). As of 31 December 2017, installed capacity in Peninsular Malaysia was 24,138.93 MW with a total power generation of 123,128.20 GWh. Of these, 53.35% were coal-fired electricity, 40.59% of natural gas, 5.76% of hydro and 0.30% of medium fuel oil (MFO) and distillate.

The installed generation capacity in Peninsular Malaysia comprises of TNB's installed capacity and IPP's where the IPP installed generation capacity is seen increasing each year. In 2017, the installed capacity of IPP power stations increased by 13.4% from 16,811.83 MW in 2016 to 19,071.83 while the installed capacity of TNB decreased by 17% from 6,106.60 MW in 2016 to 5,067.10 MW. The installed generation capacity of the IPP constitutes 79% of the installed capacity in Peninsular Malaysia of 24,138.93 MW. Additional capacity of IPP was from TNB Manjung Five coal-fired plant (1,000 MW) and Pengerang Power Sdn Bhd CCGT plant (400 MW) plus the extension of Paka YTL plant (585 MW) and TNB Pasir Gudang Sdn Bhd CCGT plant (275 MW).

Besides TNB and IPP, the generation of electricity in Peninsular Malaysia also involves renewable energy power stations including mini hydro, public cogeneration, private cogeneration and less than 5 MW self-generation which are not connected to the grid system. The total installed capacity of this category was 2,244.38 MW and 4,181.89 GWh of electricity was generated in 2017, of which 81.57% were from natural gas, 16.39% were from renewable energy such as solar, biomass, biogas and mini hydro, and the remainder of MFO, diesel and others.

At present, electricity supply in Peninsular Malaysia is still at a comfortable level where the system's reserve margin in 2017 was within 36%.

Di Sabah, kapasiti terpasang Sabah Electricity Sdn. Bhd. (SESB) dan IPP ialah 1,477.40 MW, di mana hampir 80% daripadanya merupakan stesen jana kuasa turbin gas kitar padu dan enjin diesel. Jumlah elektrik yang dijana ialah sebanyak 5,967.84 GWj dengan 88.9% campuran penjanaan didominasi oleh gas asli, diikuti oleh diesel (5.9%) dan hidro (5.2%). Kapasiti boleh harap bagi Sabah ialah 1,220.07 MW. Kehendak maksimum tertinggi di Sabah dicatatkan pada 18 Mei 2017 iaitu sebanyak 938.36 MW, 0.7% lebih rendah daripada 944.90 MW pada tahun 2016. Daripada keseluruhan penjanaan, tenaga boleh diperbaharui mencatatkan penjanaan elektrik sebanyak 462.29 GWj.

In Sabah, installed capacity of Sabah Electricity Sdn. Bhd. (SESB) and IPPs was 1,477.40 MW, of which nearly 80% of them were combined cycle gas turbine and diesel engine power stations. Total electricity generated was 5,967.84 GWh with 88.9% of the mixed generation dominated by natural gas, followed by diesel (5.9%) and hydro (5.2%). Dependable capacity of Sabah was 1,220.07 MW. The highest maximum demand in Sabah was recorded on 18 May 2017 at 938.36 MW, 0.7% lower than 944.90 MW in 2016. Of the total electricity generation, renewable energy recorded 462.29 GWh of electricity generation.

Sarawak Energy Berhad (SEB) mencatatkan kapasiti terpasang sebanyak 4,641 MW dengan penjanaan elektrik 25,580.03 GWj. Campuran penjanaan ini terdiri daripada 75.53% sumber hidro, 12.40% arang batu, 11.41% gas asli dan 0.66% diesel. Kehendak maksimum Sarawak pada tahun 2017 meningkat 16.1% daripada 3,005 MW (2016) kepada 3,489 MW. Selain penjana-penjana utama, terdapat 389 MW *cogeneration*, 0.47 MW solar (SEB), 7.50 MW hidro mini dan mikro (SEB) dan 67.61 MW penjanaan persendirian. Daripada jumlah keseluruhan kapasiti terpasang di Sarawak pada tahun 2017, 45.07 MW ialah tenaga boleh diperbaharui dengan jumlah penjanaan sebanyak 78.35 GWj.

Sarawak Energy Berhad (SEB) recorded an installed capacity of 4,641 MW with electricity generation of 25,580.03 GWh. This generation mix consists of 75.53% hydro power, 12.40% coal, 11.41% natural gas and 0.66% diesel. Maximum demand for Sarawak in 2017 increased by 16.1% from 3,005 MW (2016) to 3,489 MW. In addition to the main generators, there were 389 MW cogeneration, 0.47 MW solar (SEB), 7.50 MW mini and micro hydro (SEB) and 67.61 MW of self-generation. Of the total installed capacity in Sarawak in 2017, 45.07 MW was renewable energy with a total generation of 78.35 GWh.

PRESTASI SISTEM PENJANAAN

Prestasi sektor penjanaan elektrik diukur menggunakan beberapa penunjuk seperti purata kecekapan *thermal*, purata faktor kesediaan setara (average *equivalent availability factor*, EAF) dan purata faktor henti tugas tidak berjadual (average *equivalent unplanned outage factor*, EUOF). Di Sarawak, penunjuk yang digunakan adalah sama kecuali EUOF yang menggunakan FOR, iaitu *force outage rate*.

PERFORMANCE OF GENERATION SYSTEM

Performance of the electricity generation sector is measured using several indicators, such as average thermal efficiency, average equivalent availability factor (EAF) and average equivalent unplanned outage factor (EUOF). Sarawak applies the same indicators except FOR (force outage rate) instead of EUOF.

PURATA KECEKAPAN *THERMAL*

Di Semenanjung Malaysia, purata kecekapan *thermal* bagi hampir semua jenis stesen jana kuasa TNB dan IPP telah menurun sekitar 0.3% hingga 2.2% pada tahun 2017. Hanya stesen jana kuasa konvensional (minyak/gas) milik IPP merekodkan peningkatan kecekapan, iaitu sebanyak 1.7%.

Di Sabah, terdapat peningkatan kecekapan *thermal* bagi stesen-stesen jana kuasa turbin gas kitar padu (CCGT) dan diesel SESB. Peningkatan yang dicatatkan ialah 0.52% dan 1.07% masing-masing. Stesen-stesen jana kuasa IPP pula mencatatkan penurunan 12.31% bagi diesel dan 0.24% bagi CCGT.

Di Sarawak, hanya stesen jana kuasa kitar terbuka (OCGT) yang mencatatkan peningkatan kecekapan *thermal*, manakala stesen jana kuasa CCGT, diesel dan arang batu konvensional mencatatkan penurunan sekitar 0.6% hingga 3.9%.

AVERAGE THERMAL EFFICIENCY

In Peninsular Malaysia, the average thermal efficiency of most types of TNB and IPP power stations decreased by about 0.3% to 2.2% in 2017. Only the conventional (oil/gas) power generation of IPP's recorded an increase in efficiency, at 1.7%.

In Sabah, there was an increase in thermal efficiency of SESB's combined cycle gas turbine (CCGT) and diesel power stations. The increase was 0.52% and 1.07% respectively. IPP power stations recorded a decline of 12.31% for diesel and 0.24% for CCGT.

In Sarawak, only open cycle gas turbine (OCGT) power plants recorded increased thermal efficiency, while CCGT power plants, diesel and conventional coal recorded a decrease of about 0.6% to 3.9%.

PURATA FAKTOR KESEDIAAN SETARA (EAF)

Dari segi faktor kesediaan setara (EAF), pencapaian stesen jana kuasa CCGT, OCGT dan arang batu konvensional di Semenanjung Malaysia merekodkan peningkatan minimum 0.1%. Penurunan sebanyak 4.31% dialami oleh stesen jana kuasa konvensional (minyak/gas) milik IPP dan 0.66% oleh stesen jana kuasa hidro milik TNB.

Di Sabah, EAF stesen-stesen jana kuasa SESB dan IPP meningkat 3%-6%, kecuali stesen jana kuasa diesel IPP dan stesen jana kuasa hidro SESB. Penurunan yang dialami ialah 1.95% bagi stesen jana kuasa diesel IPP dan 7.07% stesen jana kuasa hidro SESB.

EAF di Sarawak menurun bagi stesen jana kuasa CCGT, diesel dan OCGT. Penurunan adalah sekitar 2% hingga 10.7%, di mana CCGT mencatatkan penurunan paling banyak. Bagi OCGT, EAF telah menunjukkan corak menurun sejak tahun 2015, dengan jumlah penurunan sebanyak 6.11%. Walau bagaimanapun, terdapat peningkatan EAF sebanyak 7.6% pada stesen jana kuasa arang batu konvensional.

AVERAGE EQUIVALENT AVAILABILITY FACTOR (EAF)

In terms of equivalent availability factor (EAF), the achievement of CCGT, OCGT and conventional coal power stations in Peninsular Malaysia recorded a minimum increase of 0.1%. The 4.31% decline was experienced by conventional power stations (oil/gas) owned by IPP and 0.66% by TNB's hydropower station.

In Sabah, EAF of SESB and IPP power stations increased by 3%-6%, except for the IPP diesel power stations and SESB hydroelectric power stations. The decline was 1.95% for the IPP diesel power stations and 7.07% for SESB's hydropower stations.

EAF in Sarawak declined for CCGT, diesel and OCGT power stations. The decline was about 2% to 10.7%, where the CCGT recorded the most decline. For OCGT, the EAF have shown a decline pattern since 2015, with a total decrease of 6.11%. However, there was a 7.6% increase of EAF in conventional coal power stations.

PURATA FAKTOR HENTI TUGAS TIDAK BERJADUAL (EUOF) & *FORCE OUTAGE RATE* (FOR)

Purata faktor henti tugas tidak berjadual (EUOF) bagi stesen jana kuasa konvensional (minyak/gas) IPP di Semenanjung Malaysia meningkat 2.37%, manakala stesen jana kuasa hidro TNB meningkat 0.28%. Pencapaian terbaik dicatatkan oleh stesen jana kuasa OCGT TNB iaitu EUOF menurun daripada 7.09 (2016) kepada 0.15 (2017). EUOF bagi stesen-stesen lain pula mengalami penurunan sekitar 0.58%-2.72%.

Di Sabah, EUOF tertinggi pada tahun 2017 dicatatkan oleh stesen jana kuasa diesel IPP iaitu 45.16%, di mana peningkatannya ialah sebanyak 30.37% berbanding tahun 2016. Turut mencatatkan kenaikan EUOF ialah stesen jana kuasa hidro SESB, iaitu daripada 19.23% (2016) kepada 37.61% pada tahun 2017. CCGT pula mencatatkan prestasi lebih baik dengan purata penurunan EUOF sebanyak 1.73%, manakala penurunan bagi stesen jana kuasa diesel SESB ialah 3.69%.

Di Sarawak pula, kadar hentitugas tidak berjadual (FOR) meningkat lebih empat kali ganda bagi stesen jana kuasa diesel (0.45 kepada 1.93). Selain itu, stesen jana kuasa OCGT dan CCGT juga mengalami FOR yang lebih tinggi, tetapi hanya sekitar 1% hingga 1.4%. Bagi stesen jana kuasa arang batu konvensional pula, prestasi tahun 2017 adalah lebih baik dengan penurunan FOR sebanyak 1.64%.

AVERAGE EQUIVALENT UNPLANNED OUTAGE FACTOR (EUOF) & FORCE OUTAGE RATE (FOR)

Average equivalent unplanned outage factor (EUOF) for Peninsular Malaysia's IPP conventional power (oil / gas) stations increased by 2.37%, while TNB's hydro power station increased 0.28%. The best performance was recorded by TNB's OCGT power stations, which the EUOF decreased from 7.09 (2016) to 0.15 (2017). EUOF for other stations decreased by 0.58% -2.72%.

In Sabah, the highest EUOF in 2017 was 45.16% recorded by the IPP diesel power stations, where the increase was 30.37% compared to 2016. A rise was also recorded by SESB hydropower station, from 19.23% (2016) to 37.61% in 2017. CCGT recorded a better performance with an average reduction of EUOF of 1.73%, while the SESB's diesel power statons recorded a 3.69% decrease.

In Sarawak, the forced outage rate (FOR) increased by more than four times for diesel generators (0.45 to 1.93). In addition, OCGT and CCGT power plants also experienced a higher FOR, but only about 1% to 1.4%. For conventional coal-fired power stations, the performance in 2017 was better with 1.64% reduction.

PRESTASI SISTEM PENGHANTARAN

DAYA HARAP SISTEM

Pada tahun 2017, *Delivery Point Unrealibility Index* (DePUI) di Semenanjung Malaysia menunjukkan perubahan positif, iaitu berkurang sebanyak 81.1% daripada 1.43 minit pada 2016 kepada 0.27 minit. Terdapat hanya satu pelantikan tanpa lucutan beban pada tahun tersebut.

Di Sabah pula, berbanding tahun 2016, prestasi sistem penghantaran pada tahun 2017 meningkat 10.1%. Ini berikutan DePUI yang lebih rendah, iaitu 12.65 minit berbanding 14.07 minit pada 2016. Walau bagaimanapun, jumlah pelantikan dengan lucutan beban dan tanpa lucutan beban kekal sama, iaitu lima.

DePUI di Sarawak berkurangan sebanyak 72.2% berbanding tahun 2016, di mana ianya juga merupakan rekod DePUI terendah sejak tahun 2013.

PERFORMANCE OF TRANSMISSION SYSTEM

SYSTEM RELIABILITY

In 2017, the Delivery Point Unrealibility Index (DePUI) in Peninsular Malaysia showed a positive change of 81.1% from 1.43 minutes in 2016 to 0.27 minutes. There was only one tripping without load shedding in that year, compared to three trippings in 2016.

Meanshile in Sabah, the performance of transmission system in 2017 increased by 10.1% compared to 2016. This was due to lower DePUI, 12.65 minutes compared to 14.07 minutes in 2016. However, the number of tripping with and without load sheddings remained the same, which was five.

DePUI in Sarawak decreased by 72.2% compared to 2016, which it was also the lowest DePuI since 2013.

PRESTASI SISTEM PENGAGIHAN

Pencapaian SAIDI

SAIDI keseluruhan bagi Semenanjung Malaysia meningkat sebanyak 10.5% pada tahun 2017 kepada 54.49 minit/pelanggan/tahun. Di peringkat negeri, Perlis mencatatkan SAIDI tertinggi iaitu 144.01 minit/pelanggan/tahun, dengan peningkatan sebanyak 300.5% berbanding 35.98 minit/pelanggan/tahun pada 2016.

Ini diikuti oleh Kedah yang mencatatkan peningkatan SAIDI sebanyak 35.7%, manakala Putrajaya/Cyberjaya memepunyai SAIDI terendah iaitu 0.55 minit/pelanggan/tahun.

SAIDI keseluruhan bagi NUR Generation Sdn. Bhd. pula ialah 28.53 minit/pelanggan/tahun, iaitu 39.2% lebih tinggi daripada tahun sebelumnya. Peningkatan ini disumbangkan oleh SAIDI industri yang meningkat lebih 4 kali ganda iaitu daripada 1.18 kepada 4.91 minit/pelanggan/tahun.

Di Sabah, SAIDI tahun 2017 menurun 0.23% kepada 240.90 minit/pelanggan/tahun. Ini menyumbang kepada corak menurun SAIDI Sabah yang direkodkan sejak tahun 2014, di mana perbezaan SAIDI pada tahun 2014 dengan tahun 2017 ialah 69%.

SAIDI di Sarawak menurun 6.72% daripada 119 kepada 111 minit/pelanggan/tahun. Bacaan ini jua merupakan rekod SAIDI terbaik bagi negeri Sarawak sejak tahun 2013.

PERFORMANCE OF DISTRIBUTION SYSTEM

SAIDI in Peninsular and Sabah

Overall SAIDI for Peninsular Malaysia increased by 10.5% in 2017 to 54.49 minutes/customer/year. At state level, Perlis recorded the highest SAIDI of 144.01 minutes/customer/year, with an increase of 300.5% compared to 35.98 minutes/customer/year in 2016.

This was followed by Kedah which recorded a SAIDI increase of 35.7%, while Putrajaya/Cyberjaya had the lowest SAIDI of 0.55 minutes/customer/year.

Overall SAIDI for NUR Generation Sdn. Bhd. was 28.53 minutes/customer/year, which was 39.2% higher than the previous year. The increase was contributed by the SAIDI of industries which rose more than 4 times from 1.18 to 4.91 minutes/customer/year.

In Sabah, SAIDI in 2017 decreased 0.23% to 240.90 minutes/customer/year. This contributes to the SAIDI Sabah decline pattern recorded since 2014, where the SAIDI difference in 2014 with 2017 is 69%.

SAIDI in Sarawak decreased 6.72% from 119 to 111 minutes/customer/year. This reading was also the best SAIDI record for Sarawak since 2013.

Gangguan Bekalan Elektrik

Di Semenanjung Malaysia, terdapat 7.07 gangguan bekalan elektrik bagi setiap 1,000 pengguna pada tahun 2017, iaitu lebih tinggi daripada tahun 2016 (6.84). Daripada jumlah ini, peratusan gangguan tidak berjadual ialah 99.2% di mana ianya meningkat 4.94% berbanding tahun 2016. Gangguan berjadual pula berkurangan sebanyak 64.43%.

Secara keseluruhannya pada tahun 2017, terdapat 60,058 gangguan bekalan elektrik di Semenanjung, dengan peningkatan sebanyak 3.24% berbanding tahun 2016. Dari jumlah tersebut, sebanyak 51,292 gangguan dari sistem Voltan Rendah 1kV ke bawah. Negeri Selangor mencatatkan gangguan bekalan elektrik yang paling tinggi berbanding dengan negeri-negeri lain.

Di Kulim Hi-Tech Park (KHTP), jumlah gangguan bekalan elektrik pada tahun 2017 ialah 104, iaitu 15.4% lebih rendah daripada 2016. Jika dilihat daripada rekod tahun 2013 (148 gangguan bekalan) hingga 2017 (104 gangguan bekalan), gangguan bekalan menunjukkan corak menurun. Bagi setiap 1,000 pengguna pula, bilangan gangguan berkurangan sebanyak 19.8%. Gangguan berjadual ialah 11.61 per 1,000 pengguna dan gangguan tidak berjadual ialah 8.51 per 1,000 pengguna.

Terdapat 18,661 gangguan bekalan elektrik berlaku di Sabah pada tahun 2017. Gangguan berjadual didapati meningkat 46.4%, manakala gangguan tidak berjadual berkurang sebanyak 11.3%. Secara keseluruhannya, gangguan bekalan menurun sebanyak 7.43% berbanding tahun 2016. Bilangan gangguan bekalan elektrik bagi setiap 1,000 pengguna di Sabah juga berkurang 6.3% daripada 34.49 pada tahun 2016 kepada 32.31 pada tahun 2017.

Di Sarawak, gangguan bekalan elekrik berjadual berkurang 52.03%, manakala terdapat sedikit pertambahan pada gangguan tidak berjadual iaitu sebanyak 3.37%.

PRESTASI KUALITI KUASA

Prestasi keboleh harapan sistem pembekalan elektrik di Semenanjung Malaysia bertambah baik pada tahun 2017, berdasarkan jumlah junaman voltan yang berkurangan sebanyak 13.54% berbanding tahun 2016. Daripada 923 kejadian pada 2016, jumlah junaman voltan telah berkurang kepada 798 pada tahun 2017.

Kejadian junaman voltan di KHTP pula berkurangan kepada kepada 17 berbanding 19 pada tahun 2016. Kejadian yang berpunca daripada sistem pengagihan NUR juga menurun

Interruptions of electricity supply

In Peninsular Malaysia, there were 7.07 electricity outages per 1,000 consumers in 2017, higher than 2016 (6.84). Of these, the percentage of unscheduled interruptions was 99.2%, which increased by 4.94% compared to 2016. Scheduled interruptions decreased by 64.43%.

Overall, there were 60,058 electricity supply interruptions in the Peninsular in 2017, with an increase of 3.24% compared to 2016. From that total, 51,292 interruptions from the Low Voltage System 1kV and below. The state of Selangor recorded the highest interruptions of electricity supply compared to other states.

In Kulim Hi-Tech Park (KHTP), the total number of electricity supply interruptions in 2017 was 104, which was 15.4% lower than 2016. As seen from the 2013 record (148 supply disruptions) to 2017 (104 supply disruptions), the interruption showed a decreasing pattern. For every 1,000 consumers, the number of interruptions decreased by 19.8%. Scheduled interruptions were 11.61 per 1,000 consumers and unscheduled interruptions were 8.51 per 1,000 consumers.

There were 18,661 supply interruptions in Sabah in 2017. Scheduled interruptions increased by 46.4%, while unscheduled interruptions decreased by 11.3%. Overall, supply interruptions declined by 7.43% compared to 2016. The number of electricity supply interruptions per 1,000 consumers in Sabah also decreased 6.3% from 34.49 in 2016 to 32.31 in 2017.

In Sarawak, scheduled electricity supply interruption also decreased by 52.03%, while there was a slight increase in unscheduled disruptions by 3.37%.

PERFORMANCE OF POWER QUALITY

The reliability of electricity supply system in Peninsular Malaysia has improved in 2017, based on the number of voltage dips which decreased by 13.54% compared to 2016. From 923 incidents in 2016, number of voltage dips has decreased to 798 in 2017.

Voltage dips at KHTP decreased to 17 compared with 19 in 2016. Incidents originated from NUR distribution system also decreased, from five to one. Nevertheless, voltage dips caused

daripada lima kepada satu. Walaupun demikian, kejadian yang berpunca daripada sistem penghantaran TNB mencatatkan peningkatan daripada 14 kepada 16 kejadian. Selain itu, bilangan pengguna yang terlibat turun mendadak sebanyak 63.64% daripada 22 kepada 8.

by TNB transmission system recorded an increase from 14 to 16 incidents. In addition, number of customers involved suddenly dropped by 63.64% fom 22 to 8.

Selain itu, indeks SARFI Semenanjung juga menunjukkan penurunan iaitu 1.52 ($SARFI_{70}$), 2.50 ($SARFI_{80}$) dan 4.99 ($SARFI_{90}$). Bacaan-bacaan ini adalah lebih rendah sekitar kira-kira 15% berbanding pada tahun 2016.

In addition, the Peninsular SARFI index also showed a decrease of 1.52 ($SARFI_{70}$), 2.50 ($SARFI_{80}$) and 4.99 ($SARFI_{90}$). These readings are lower by about 15% compared to 2016.

MALAYSIA SEPINTAS LALU
MALAYSIA AT A GLANCE

	2013	2014	2015	2016	2017
Keluasan (km^2)* *Area (km^2)**	330,396	330,323	330,345	330,345	330,621
Penduduk (Juta) ***Population (Million)***					
Jumlah *Total*	30.21	30.71	31.19	31.63	32.02
Lelaki *Male*	15.60	15.87	16.11	16.35	16.54
Perempuan *Female*	14.61	14.84	15.07	15.29	15.48
Keluaran Dalam Negeri Kasar (KDNK) ***Gross Domestic Product (GDP)***					
KDNK pada harga semasa (RM juta) *GDP at current prices (RM million)*	1,018,614	1,106,443	1,158,513	1,231,020[e]	1,353,380[p]
KDNK pada harga malar 2010 (RM juta) *GDP at constant 2010 prices (RM million)*	955,080	1,012,449	1,063,998	1,108,935[e]	1,174,329[p]
Pertumbuhan KDNK (%) *GDP Growth (%)*	4.7	6.0	5.1	4.2[e]	5.9[p]
KDNK per kapita pada harga semasa (RM) *GDP per capita at current prices (RM)*	33,714	36,030	37,148	38,915[e]	42,228[p]
Guna Tenaga [2] ***Employment [2]***					
Tenaga buruh ('000) *Labour force ('000)*	13,980.5	14,263.6	14,518.0	14,667.8	14,952.6
Penduduk bekerja ('000) *Employed ('000)*	13,545.4	13,852.6	14,067.7	14,163.7	14,450.0

Sumber: *Source:*
Malaysia Sepintas Lalu (https://www.dosm.gov.my)
Malaysia @ a Glance (https://www.dosm.gov.my)

Nota: *Notes:*

1. 2013 - 2017: Anggaran Penduduk berasaskan data Banci Penduduk dan Perumahan Malaysia 2010 yang disesuaikan.
   2013 - 2017: Population Estimates based on the adjusted Population and Housing Census of Malaysia 2010.

2. Mulai 2011, statistik tenaga buruh dianggarkan berasaskan anggaran penduduk semasa yang terkini. Oleh itu, siri masa statistik tenaga buruh tahunan dikemas kini.
   Starting 2011, the labour force statistics are estimated based on the latest current population estimates. Therefore the annually statistics labour force time series is updated.

3. [p] Permulaan
   Preliminary

4. [e] Anggaran
   Estimation

5. Hasil tambah mungkin berbeza kerana pembundaran
   The added total may differ due to rounding.

6. * Sumber: Jabatan Ukur dan Pemetaan Malaysia (JUPEM)
   * *Source: Department of Survey and Mapping Malaysia*

7. Kemas kini: 14 November 2018
   Updated: 14 November 2018

Peta Malaysia
Map Of Malaysia

Terletak di antara 2 dan 7 darjah utara Garisan Khatulistiwa, Semenanjung Malaysia dipisahkan daripada Sabah dan Sarawak oleh Laut China Selatan. Thailand terletak di utara Semenanjung Malaysia, manakala negara jiran di selatan adalah Singapura. Sabah dan Sarawak disempadani oleh Indonesia, manakala Sarawak juga berkongsi sempadan dengan Brunei.

Located between 2 and 7 degrees north of the Equator, Peninsular Malaysia is separated from the states of Sabah and Sarawak by the South China Sea. To the north of Peninsular Malaysia is Thailand while its southern neighbour is Singapore. Sabah and Sarawak are bounded by Indonesia while Sarawak also shares a border with Brunei.

Negeri-negeri di Malaysia:
States in Malaysia:

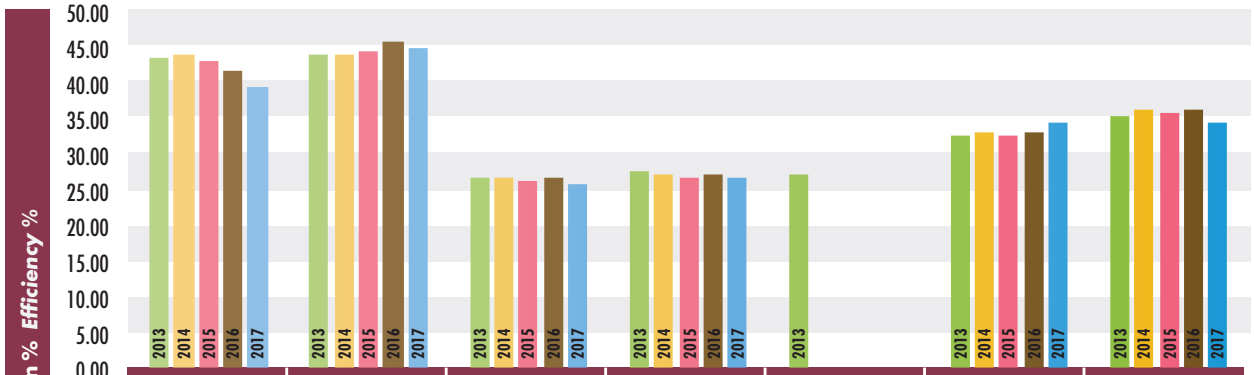
1. Kedah
2. Perlis
3. Pulau Pinang
4. Perak
5. Kelantan
6. Terengganu
7. Pahang
8. Selangor
9. Negeri Sembilan
10. Kuala Lumpur *
11. Putrajaya*
12. Melaka
13. Johor
14. Sarawak
15. Sabah
16. Labuan*

Nota: *Notes:*
* Wilayah Persekutuan *Federal Territory*

MAKLUMAT PRESTASI SEMENANJUNG MALAYSIA

PERFORMANCE INFORMATION OF PENINSULAR MALAYSIA

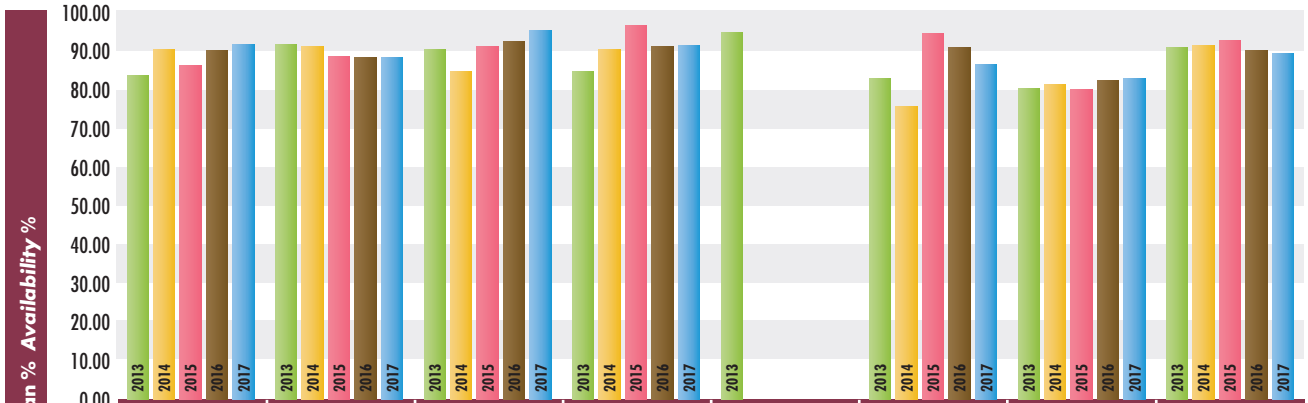
Purata kecekapan *thermal* mengikut jenis loji jana kuasa
Average thermal efficiency by type of power plants



	CCGT TNB	CCGT IPP	OCGT TNB	OCGT IPP	Minyak/Gas Konvensional *(Conventional Oil/Gas)* TNB	Minyak/Gas Konvensional *(Conventional Oil/Gas)* IPP	Arang Batu Konvensional *(Conventional Coal)* IPP
2013	43.30	44.00	26.70	27.40	27.00	32.70	35.20
2014	43.63	43.66	26.70	26.93	-	32.81	36.30
2015	43.14	44.24	26.23	26.61	-	32.52	35.65
2016	41.49	45.65	26.55	26.82	-	32.83	36.21
2017	39.34	44.74	26.88	26.50	-	34.52	34.51

Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Purata faktor kesediaan setara (EAF) mengikut jenis loji jana kuasa di Semenanjung Malaysia
Average equivalent availability factor (EAF) by type of power plants in Peninsular Malaysia

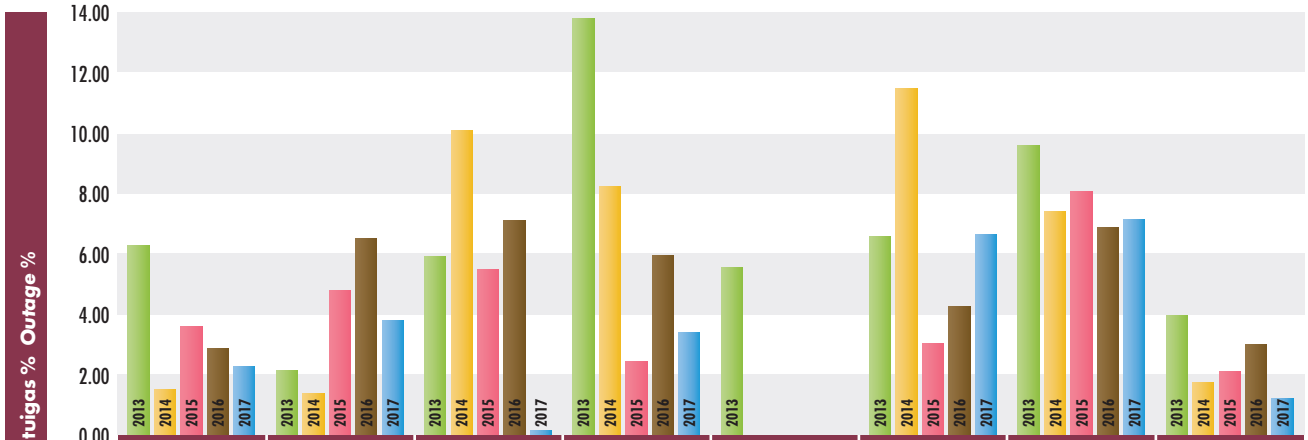


	CCGT TNB	CCGT IPP	OCGT TNB	OCGT IPP	Minyak/Gas Konvensional *(Conventional Oil/Gas)* TNB	Minyak/Gas Konvensional *(Conventional Oil/Gas)* IPP	Arang Batu Konvensional *(Conventional Coal)* IPP	Hidro *(Hydro)* TNB
2013	83.50	91.60	90.40	84.80	94.50	82.40	80.10	90.60
2014	90.17	91.19	84.44	90.14	-	75.62	81.31	91.38
2015	86.15	88.41	91.11	96.45	-	94.43	79.92	92.52
2016	89.85	88.05	92.36	91.07	-	90.68	82.28	89.95
2017	91.41	88.21	95.09	91.21	-	86.37	82.64	89.29

Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Purata faktor henti tugas tidak berjadual setara (EUOF) mengikut jenis loji jana kuasa di Semenanjung Malaysia

Average equivalent unplanned outage factor (EUOF) by type of power plants in Peninsular Malaysia



	CCGT TNB	CCGT IPP	OCGT TNB	OCGT IPP	Minyak/Gas Konvensional *(Conventional Oil/Gas)* TNB	Minyak/Gas Konvensional *(Conventional Oil/Gas)* IPP	Arang Batu Konvensional *(Conventional Coal)* IPP	Hidro *(Hydro)* TNB
2013	6.28	2.13	5.89	13.80	5.55	6.57	9.58	3.94
2014	1.49	1.38	10.07	8.23	-	11.48	7.40	1.74
2015	3.60	4.79	5.47	2.42	-	3.02	8.04	2.09
2016	2.85	6.50	7.09	5.95	-	4.26	6.85	2.98
2017	2.27	3.78	0.15	3.39	-	6.63	7.13	1.20

Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

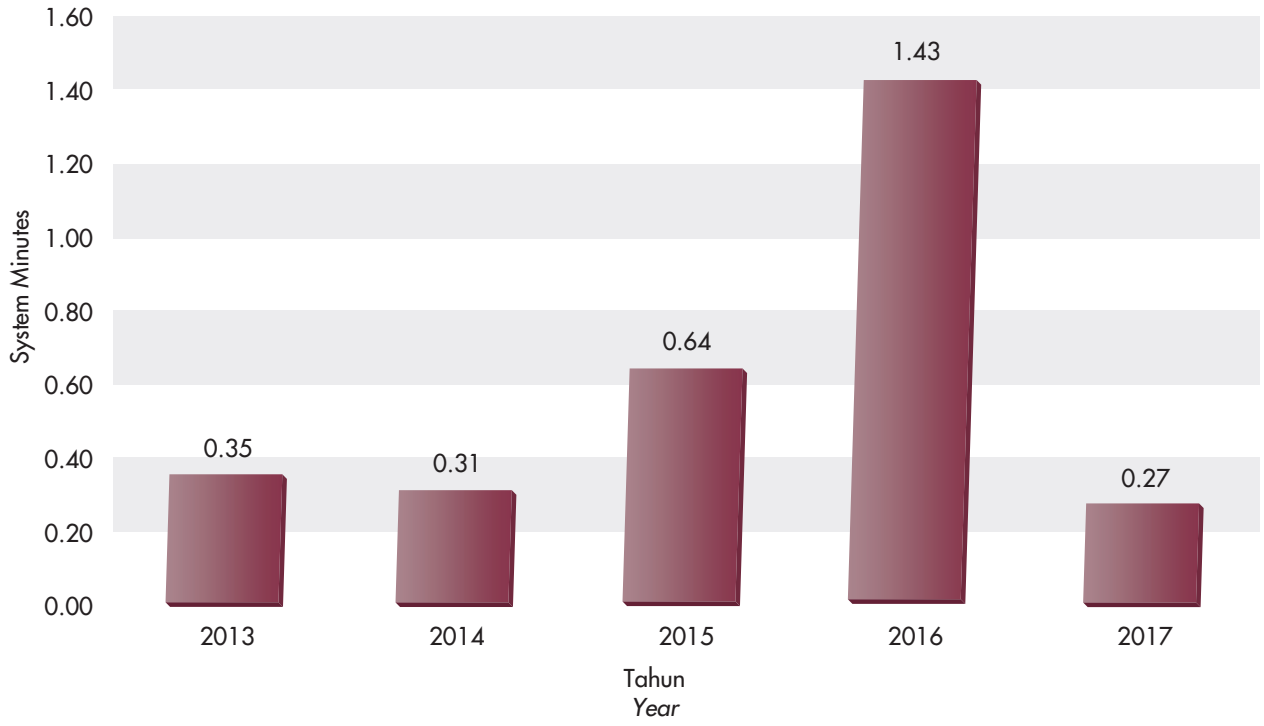
Jadual 1: Pelantikan sistem penghantaran TNB dengan kehilangan beban sebanyak 50 MW dan ke atas di Semenanjung Malaysia

Table 1: TNB transmission system trippings with load loss of 50 MW and above in Peninsular Malaysia

Petunjuk • *Indicator*	2013	2014	2015	2016	2017
Bilangan pelantikan tanpa lucutan beban *Number of trippings without load shedding*	2	1	1	3	1
Tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Unsupplied energy during trippings (MWh)*	238.20	1.20	-	344.85	40.30
Bilangan pelantikan dengan lucutan beban *Number of trippings with load shedding*	-	1	1	1	-
Tenaga tidak dibekalkan semasa lucutan beban (MWj) *Unsupplied energy during load shedding (MWh)*	-	-	67.60	425	-

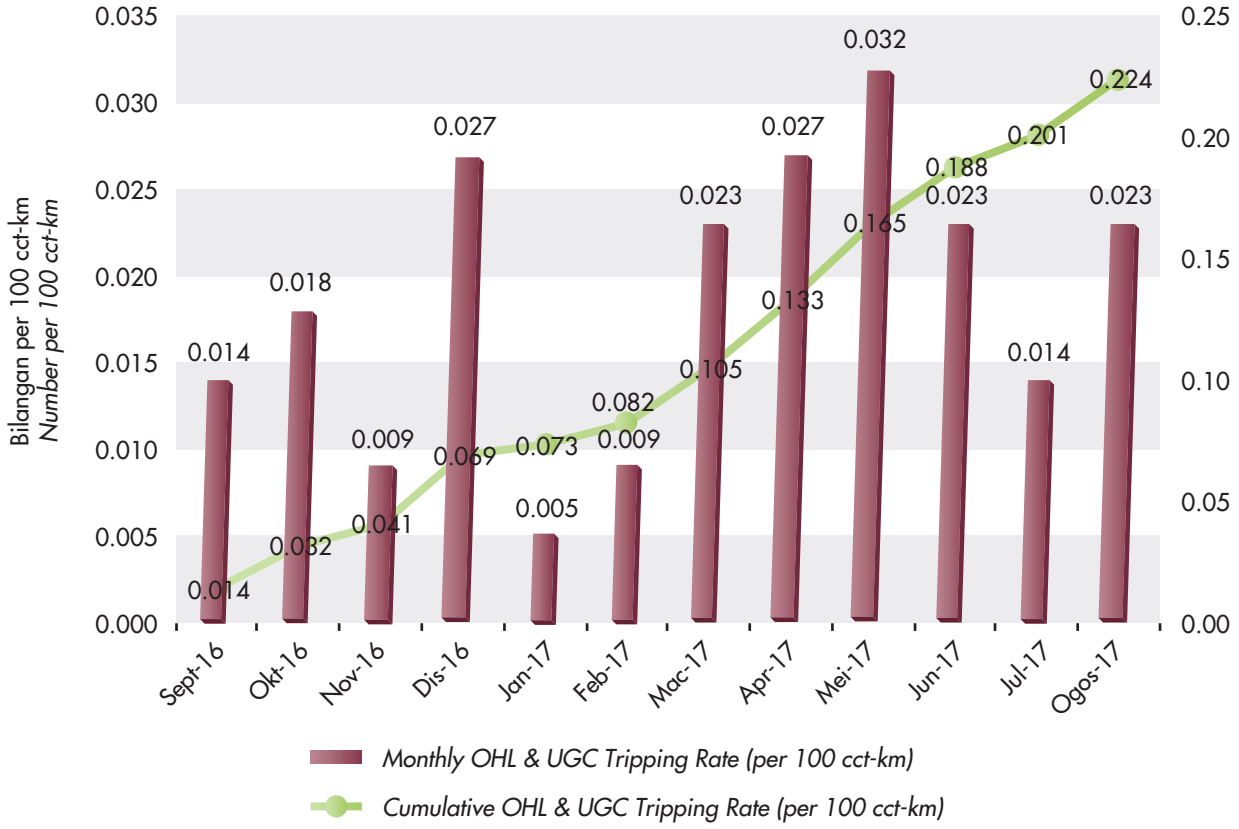
Delivery point unreliability index (DePUI) - *System minutes* TNB di Semenanjung Malaysia

Delivery point unreliability index (DePUI) – TNB system minutes in Peninsular Malaysia



Nota: *Notes:*
Tahun Kewangan *Financial Year*

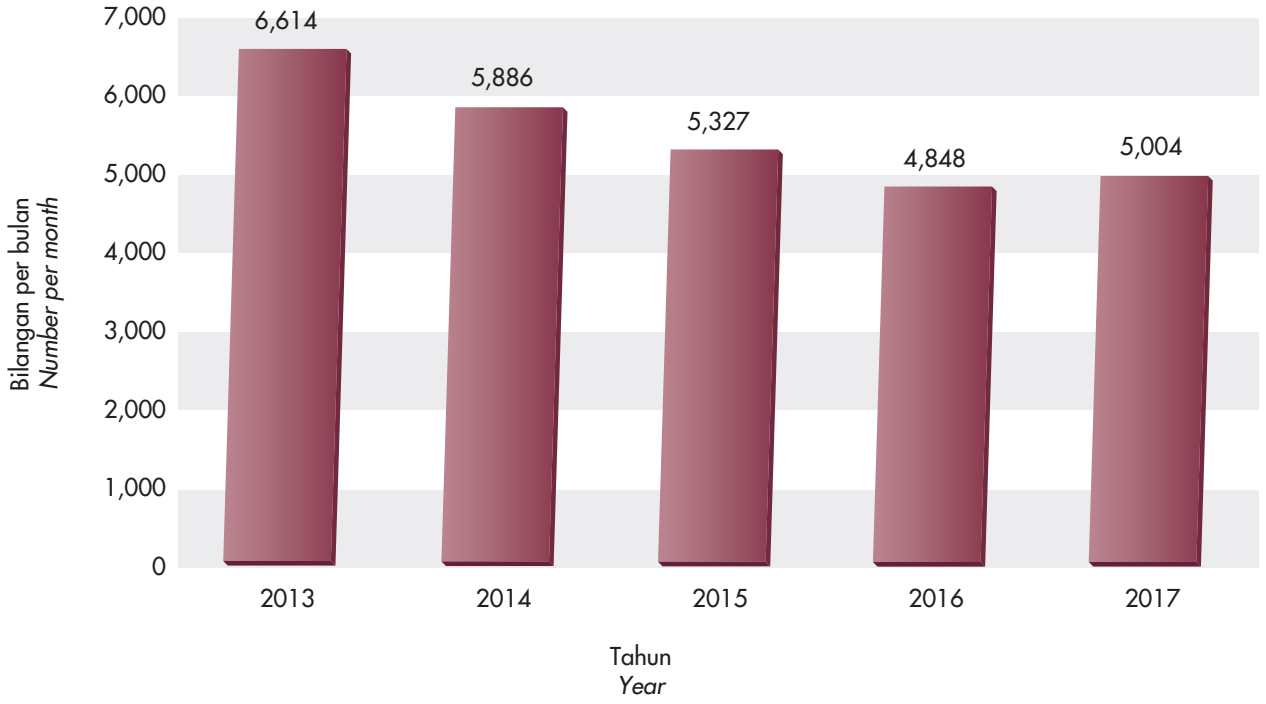
Insiden pelantikan bulanan TNB bagi talian/kabel per 100 cct-km di Semenanjung Malaysia
TNB monthly tripping incidents for lines/cables per 100 cct-km in Peninsular Malaysia



Nota: *Notes:*
Data tahun kewangan yang diperolehi daripada Laporan Syarat Lesen 25 (4) TNB *(Transmission Reliability Standard)* TNB November 2017
Financial year data obtained from License Condition 25(4) TNB (Transmission Reliability Standard) TNB November 2017

Gangguan bekalan elektrik TNB per 1,000 pengguna di Semenanjung Malaysia
TNB electricity supply interruptions per 1,000 consumers in Peninsular Malaysia

Purata gangguan bekalan elektrik bulanan TNB di Semenanjung Malaysia
TNB monthly average electricity supply interruptions in Peninsular Malaysia



Jadual 2: Gangguan bekalan elektrik mengikut negeri di Semenanjung Malaysia
Table 2: Electricity supply interruptions by state in Peninsular Malaysia

NEGERI *STATE*	2013	2014	2015	2016	2017
Johor	11,554	7,719	8,354	7,649	6,509
Kedah	6,642	5,538	3,799	3,999	4,715
Kelantan	7,469	5,901	5,781	3,832	4,135
Kuala Lumpur	9,861	9,391	9,470	8,779	6,685
Melaka	3,307	3,939	1,694	1,458	717
Negeri Sembilan	6,264	4,966	5,226	4,784	4,078
Pahang	4,460	5,399	4,971	5,874	9,761
Perak	8,029	8,050	6,601	5,538	7,458
Perlis	422	1,086	465	343	513
Pulau Pinang	6,678	5,021	3,815	3,348	3,221
Putrajaya / Cyberjaya	9	4	25	13	16
Selangor	10,968	9,768	12,268	11,332	10,163
Terengganu	3,709	3,847	1,451	1,226	2,087
JUMLAH *TOTAL*	**79,372**	**70,629**	**63,920**	**58,175**	**60,058**

Gangguan bekalan elektrik mengikut tahap voltan di Semenanjung Malaysia
Electricity supply interruptions by voltage level in Peninsular Malaysia

Jadual 3: Bilangan gangguan bekalan elektrik di Semenanjung Malaysia
Table 3: Number of electricity supply interruptions in Peninsular Malaysia

BILANGAN ***NUMBER***	**2013**	**2014**	**2015**	**2016**	**2017**
Gangguan tidak berjadual *Unscheduled interruptions*	78,647	69,260	62,420	56,775	59,560
Gangguan berjadual *Scheduled interruptions*	725	1,369	1,500	1,400	498
JUMLAH ***TOTAL***	**79,372**	**70,629**	**63,920**	**58,175**	**60,058**

Jadual 4: Gangguan bekalan elektrik tidak berjadual mengikut jenis gangguan (tidak termasuk gangguan voltan tinggi) di Semenanjung Malaysia

Table 4: Number of unscheduled electricity supply interruptions by type of interruptions (excluding high voltage interruptions) in Peninsular Malaysia

KATEGORI *CATEGORY*	Voltan rendah *Low voltage*	Voltan sederhana *Medium voltage*	JUMLAH *TOTAL*
Alat ubah *Transformer*	n/a	30	**30**
Auto reclose	n/a	211	**211**
Banjir *Flood*	66	2	**68**
Feeder pillar	1,970	n/a	**1,970**
Fius *Fuse*	2,108	1	**2,109**
Haiwan *Animal*	399	138	**537**
Insulating piercing connectors (IPC)	14,976	n/a	**14,976**
Jumper	n/a	7	**7**
Kabel *Cable*	1,101	1,718	**2,819**
Konduktor *Conductor*	7,566	144	**7,710**
Kotak fius *Fuse box*	3,972	3	**3,975**
Lain-lain *Others*	6,154	9	**6,163**
Null	n/a	885	**885**
Pautan *Link*	28	0	**28**
Penamatan *Termination*	86	7	**93**
Penebat *Insulator*	n/a	4	**4**
Peralatan suis *Switchgear*	n/a	65	**65**
Pihak ketiga *Third party*	2,740	583	**3,323**
Pokok *Tree*	7,154	61	**7,215**
Relay	n/a	7	**7**
Ribut *Storm*	75	23	**98**
Sambungan *Joint*	1	4,649	**4,650**
Tiang *Pole*	1,710	12	**1,722**
Ubahtika *Transient*	n/a	43	**43**
Vandalisme *Vandalism*	833	13	**846**
JUMLAH *TOTAL*	**50,939**	**8,615**	**59,554**

Nota: *Notes:*
Data tidak tersedia *Data not available*

Jadual 5: *System average interruption duration index* (SAIDI) mengikut tahap voltan di Semenanjung Malaysia
Table 5: System average interruption duration index (SAIDI) by voltage level in Peninsular Malaysia

TAHAP VOLTAN *VOLTAGE LEVEL*	Minit/Pelanggan/Tahun *Minutes/Customer/Year*				
	2013	2014	2015	2016	2017
Voltan tinggi (66 kV dan ke atas) *High voltage (66 kV and above)*	0.11	2.64	1.05	0.38	0.36
Voltan sederhana (6.6 kV – 33 kV) *Medium voltage (6.6 kV – 33 kV)*	56.20	50.84	47.78	46.46	51.78
Voltan rendah (1 kV dan ke bawah) *Low voltage (1 kV and below)*	4.04	3.16	2.66	2.45	2.35
JUMLAH *TOTAL*	**60.35**	**56.65**	**51.49**	**49.29**	**54.49**

Jadual 6: *System average interruption duration index* (SAIDI) mengikut negeri di Semenanjung Malaysia
Table 6: System average interruption duration index (SAIDI) by state in Peninsular Malaysia

NEGERI *STATE*	Minit/Pelanggan/Tahun *Minutes/Customer/Year*				
	2013	2014	2015	2016	2017
Johor	70.84	57.98	58.98	49.39	56.04
Kedah	74.38	84.34	57.42	60.82	82.51
Kelantan	69.61	56.23	56.18	67.90	59.34
Kuala Lumpur	35.85	32.96	32.36	32.39	41.01
Melaka	38.11	45.27	42.48	38.04	42.62
Negeri Sembilan	69.96	53.79	56.86	51.03	35.56
Pahang	63.70	68.94	62.61	57.22	51.30
Perak	78.95	69.04	51.64	46.23	52.83
Perlis	36.79	38.94	34.09	35.98	144.10
Pulau Pinang	68.89	50.40	54.49	51.05	58.12
Putrajaya/Cyberjaya	0.99	0.17	0.63	0.13	0.55
Selangor	54.42	55.84	50.74	54.67	52.34
Terengganu	44.64	43.33	41.46	39.65	42.82
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**60.35**	**56.65**	**51.49**	**49.29**	**54.49**

Jadual 7: *System average interruption frequency index* (SAIFI) mengikut tahap voltan di Semenanjung Malaysia
Table 7: System average interruption frequency index (SAIFI) by voltage level in Peninsular Malaysia

TAHAP VOLTAN *VOLTAGE LEVEL*	Bilangan gangguan/Pelanggan/Tahun *Number of interruptions/Customer/Year*				
	2013	2014	2015	2016	2017
Voltan tinggi (66 kV dan ke atas) *High voltage (66 kV and above)*	0.00	0.00	0.02	0.02	0.00
Voltan sederhana (6.6 kV – 33 kV) *Medium voltage (6.6 kV – 33 kV)*	0.87	0.92	0.79	0.87	0.93
Voltan rendah (1 kV dan ke bawah) *Low voltage (1 kV and below)*	0.00	0.00	0.02	0.01	0.00
JUMLAH ***TOTAL***	**0.87**	**0.92**	**0.83**	**0.90**	**0.93**

Jadual 8: *System average interruption frequency index* (SAIFI) mengikut negeri di Semenanjung Malaysia
Table 8: System average interruption frequency index (SAIFI) by state in Peninsular Malaysia

NEGERI *STATE*	Bilangan gangguan/Pelanggan/Tahun *Number of interruptions/Customer/Year*				
	2013	2014	2015	2016	2017
Johor	0.94	0.83	0.70	0.70	0.55
Kedah	1.11	1.65	1.20	1.40	1.19
Kelantan	1.26	1.21	1.25	1.45	1.53
Kuala Lumpur	0.37	0.67	0.48	0.57	0.61
Melaka	0.56	0.71	0.58	0.64	0.55
Negeri Sembilan	0.73	0.78	0.77	0.78	0.44
Pahang	1.42	1.49	1.44	1.56	1.39
Perak	1.10	1.08	0.80	0.94	0.71
Perlis	0.47	0.43	0.46	0.57	2.32
Pulau Pinang	1.00	0.81	0.83	0.82	0.69
Putrajaya/Cyberjaya	0.01	0.08	0.01	0.15	0.00
Selangor	0.76	0.74	0.74	0.84	0.60
Terengganu	1.03	1.05	0.87	1.01	1.10
SEMENANJUNG MALAYSIA ***PENINSULAR MALAYSIA***	**0.87**	**0.92**	**0.83**	**0.90**	**0.93**

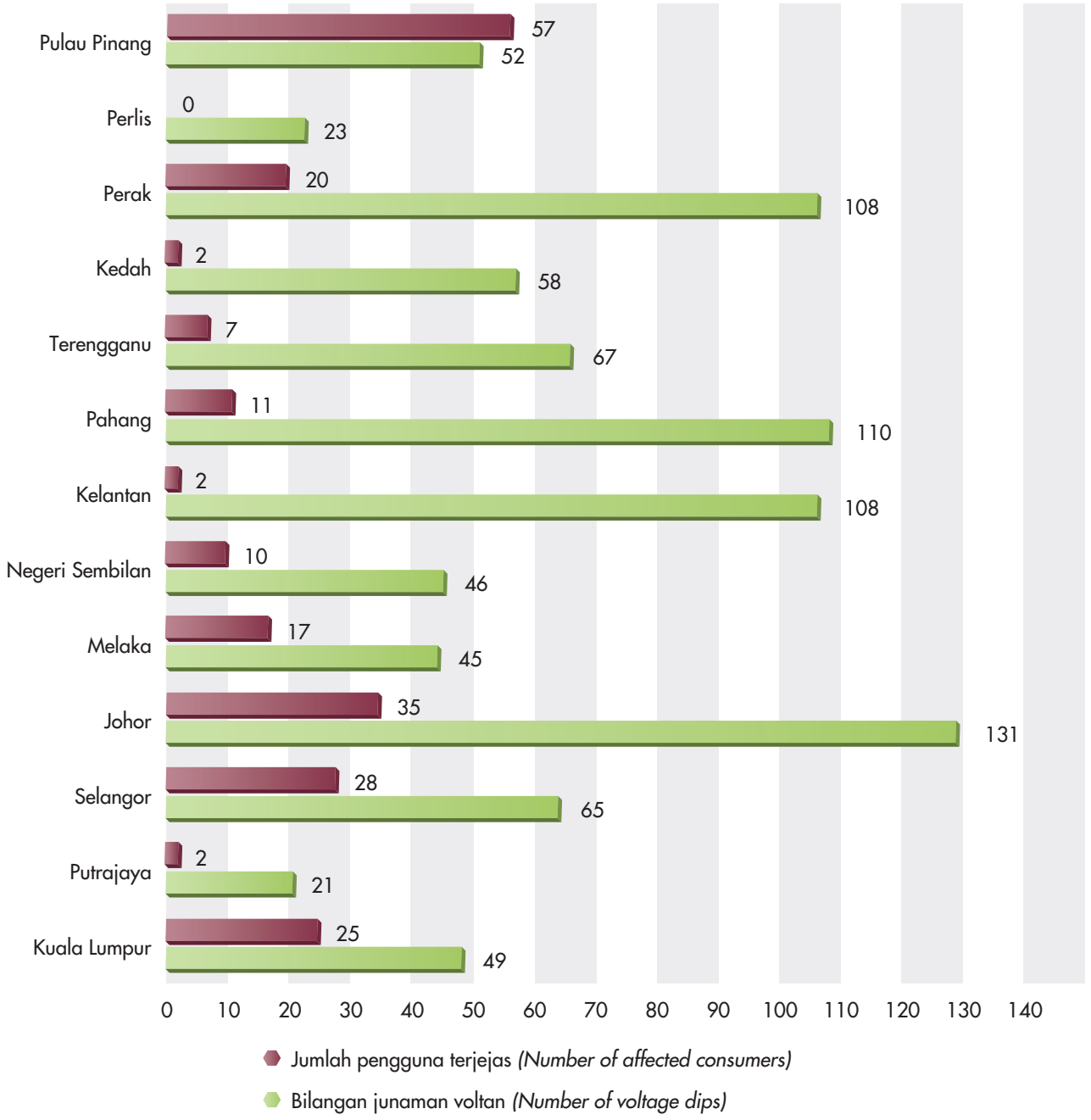
Jadual 9: *Customer average interruption duration index* (CAIDI) mengikut tahap voltan di Semenanjung Malaysia
Table 9: Customer average interruption duration index (CAIDI) by voltage level in Peninsular Malaysia

TAHAP VOLTAN *VOLTAGE LEVEL*	Minit/ Pelanggan terlibat/Tahun *Minutes/Affected customer/Year*				
	2013	2014	2015	2016	2017
Voltan tinggi (66 kV dan ke atas) *High voltage (66 kV and above)*	0.00	0.00	52.50	19.00	0.00
Voltan sederhana (6.6 kV – 33 kV) *Medium voltage (6.6 kV – 33 kV)*	64.60	55.26	60.48	53.40	55.68
Voltan rendah (1 kV dan ke bawah) *Low voltage (1 kV and below)*	403.00	316.00	133.00	245.00	0.00
JUMLAH *TOTAL*	**69.37**	**61.58**	**62.04**	**54.77**	**58.59**

Jadual 10: *Customer average interruption duration index* (CAIDI) mengikut negeri di Semenanjung Malaysia
Table 10: Customer average interruption duration index (CAIDI) by state in Peninsular Malaysia

NEGERI *STATE*	Minit/ Pelanggan terlibat/Tahun *Minutes/Affected customer/Year*				
	2013	2014	2015	2016	2017
Johor	75.36	69.86	84.26	70.56	101.89
Kedah	67.01	51.12	47.85	43.44	69.33
Kelantan	55.25	46.47	44.94	46.83	38.78
Kuala Lumpur	96.89	49.19	67.42	56.82	67.23
Melaka	68.05	63.76	73.24	59.44	77.50
Negeri Sembilan	95.84	68.96	73.84	65.42	80.81
Pahang	44.86	46.27	43.48	36.68	36.91
Perak	71.77	63.93	64.55	49.18	74.41
Perlis	78.28	90.56	74.11	63.12	62.11
Pulau Pinang	68.89	62.22	65.65	62.26	84.23
Putrajaya/Cyberjaya	99.00	2.13	63.00	0.87	0.00
Selangor	71.61	75.46	68.57	65.08	87.23
Terengganu	43.34	41.27	47.66	39.26	42.39
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**69.37**	**61.58**	**62.04**	**54.77**	**58.99**

Kejadian junaman voltan mengikut negeri dan bilangan pengguna yang terlibat di Semenanjung Malaysia
Voltage dip incidents by state and number of consumers involved in Peninsular Malaysia



Nota: *Notes:*
Jumlah bilangan kejadian junaman voltan bukan hasil tambah bilangan jumlah junaman voltan bagi setiap negeri kerana terdapat kejadian yang sama dirakamkan di beberapa negeri
The total number of occurrences of voltage dips is not summarized by the number of voltage dips in each state as there are similar events recorded in some states

Jadual 11: Bilangan pengguna TNB terlibat dengan insiden junaman voltan mengikut negeri di Semenanjung Malaysia

Table 11: Number of TNB consumers involved in voltage dip incidents by state in Peninsular Malaysia

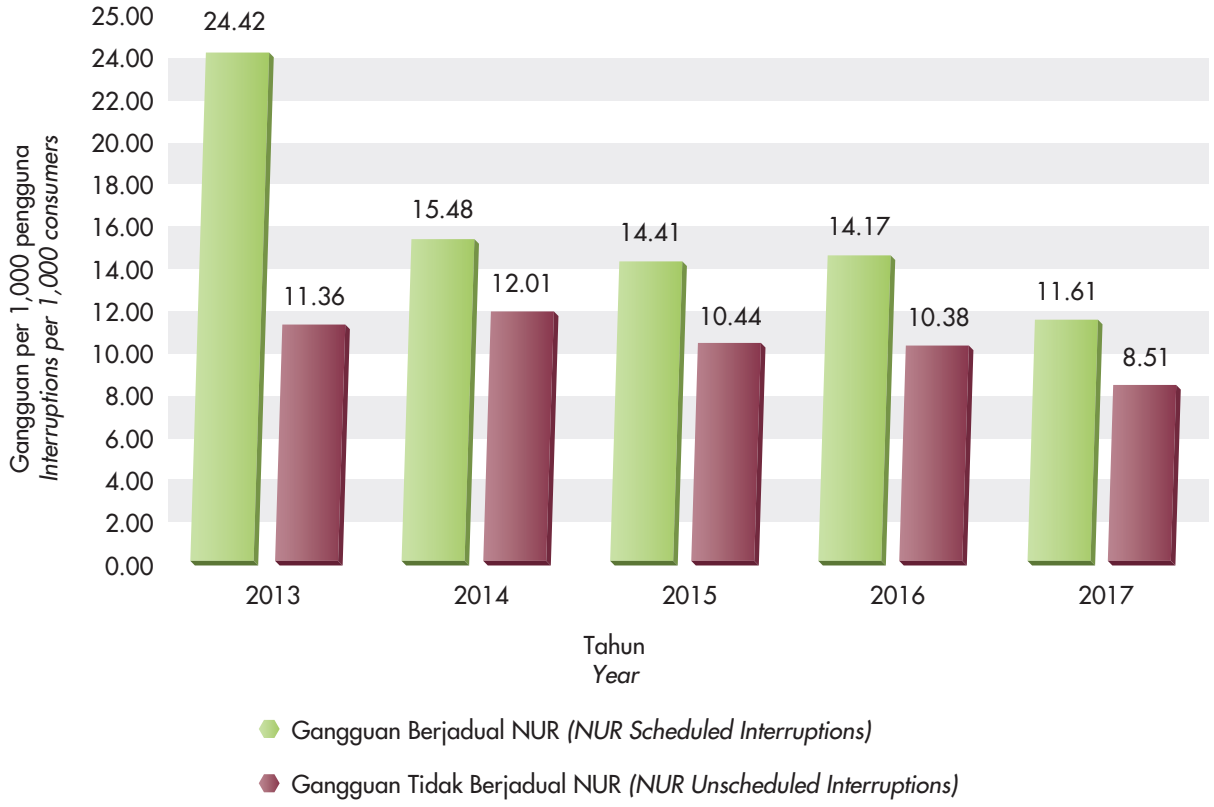
NEGERI *STATE*	2013	2014	2015	2016	2017
Johor	4	20	17	12	35
Kedah	2	5	11	7	2
Kelantan	1	3	0	0	2
Melaka	3	3	9	5	17
Negeri Sembilan	6	17	16	23	10
Pahang	7	4	4	5	11
Perak	3	7	20	14	20
Perlis	0	0	0	0	0
Pulau Pinang	27	29	64	51	57
Selangor	28	33	36	34	28
Terengganu	2	2	1	0	7
WP Kuala Lumpur	8	10	26	22	25
WP Putrajaya/Cyberjaya	2	19	5	4	2
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**93**	**152**	**209**	**177**	**216**

Jadual 12: *System average RMS frequency index* (SARFI) di Semenanjung Malaysia

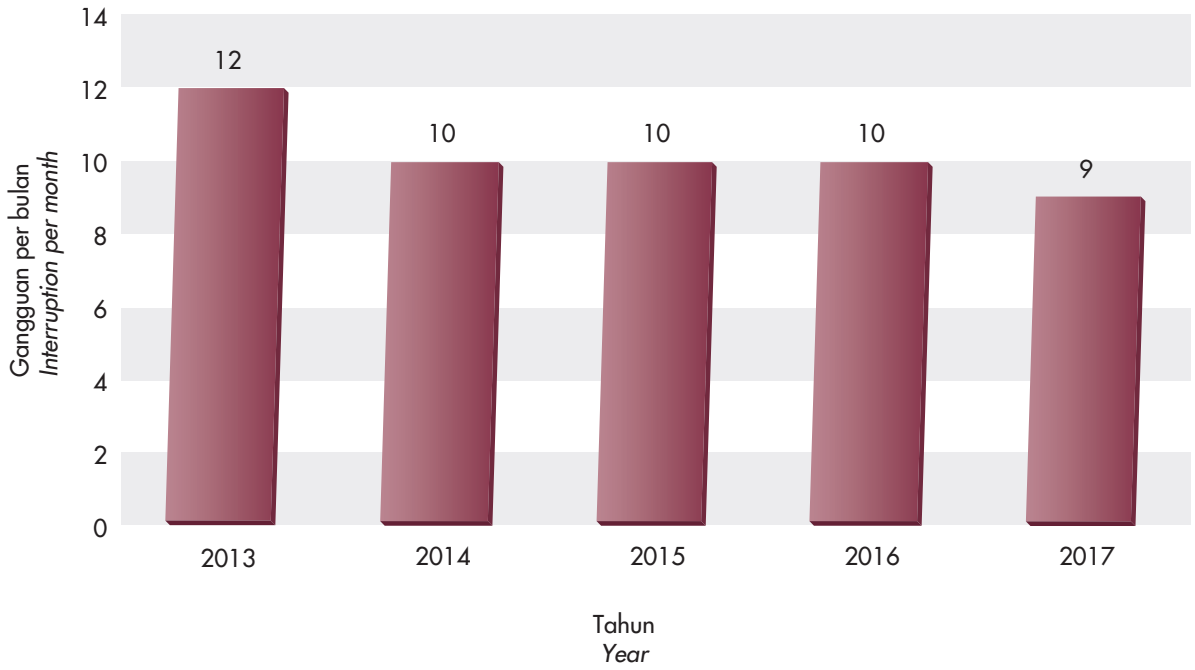
Table 12: System average RMS frequency index (SARFI) in Peninsular Malaysia

SISTEM TNB *TNB SYSTEM*	2017		
	$SARFI_{90}$	$SARFI_{80}$	$SARFI_{70}$
11 kV	5.54	3.15	2.03
22 kV	6.71	3.00	2.43
33 kV	5.30	2.29	1.08
SISTEM KESELURUHAN *OVERALL SYSTEM*	**4.99**	**2.50**	**1.52**

Gangguan bekalan elektrik per 1,000 pengguna NUR
Electricity supply interruptions per 1,000 NUR consumers



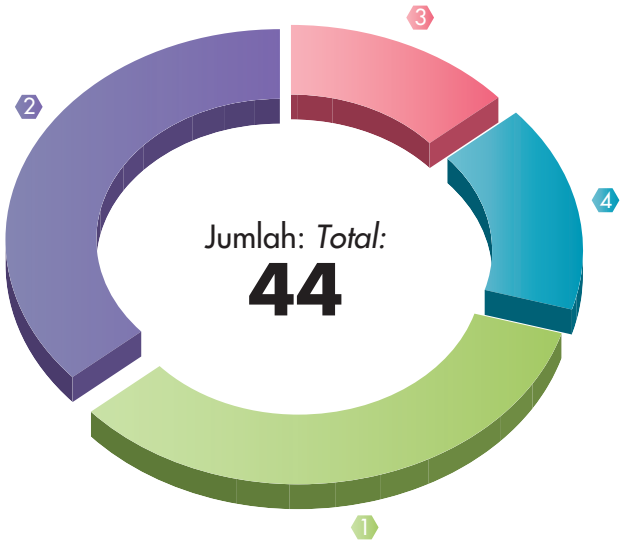
Purata gangguan bekalan elektrik bulanan NUR
Monthly average of NUR electricity supply interruptions



Jadual 13: Bilangan gangguan bekalan elektrik NUR
Table 13: Number of NUR electricity supply interruptions

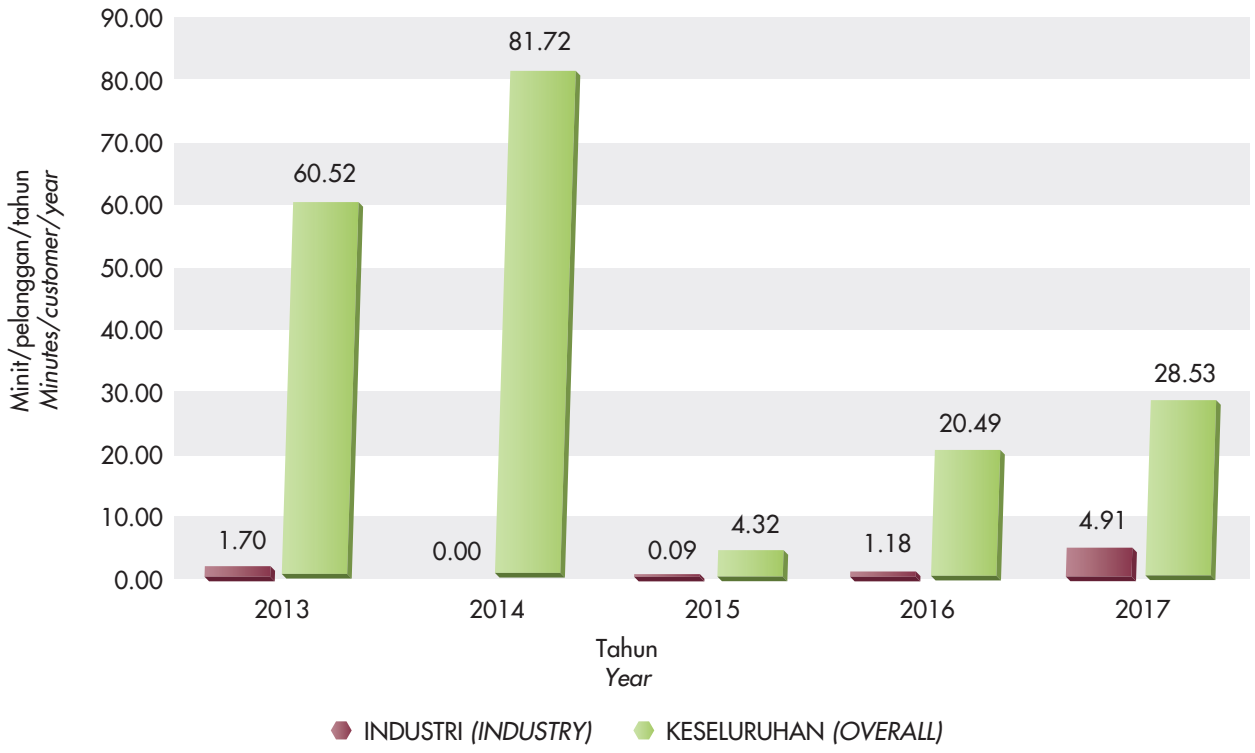
BILANGAN *NUMBER*	2013	2014	2015	2016	2017
Gangguan tidak berjadual *Unscheduled interruptions*	47	52	50	52	44
Gangguan berjadual *Scheduled interruptions*	101	67	69	71	60
JUMLAH *TOTAL*	**148**	**119**	**119**	**123**	**104**

Gangguan bekalan elektrik tidak berjadual NUR mengikut jenis gangguan
Unscheduled supply interruption of NUR by type of interruptions

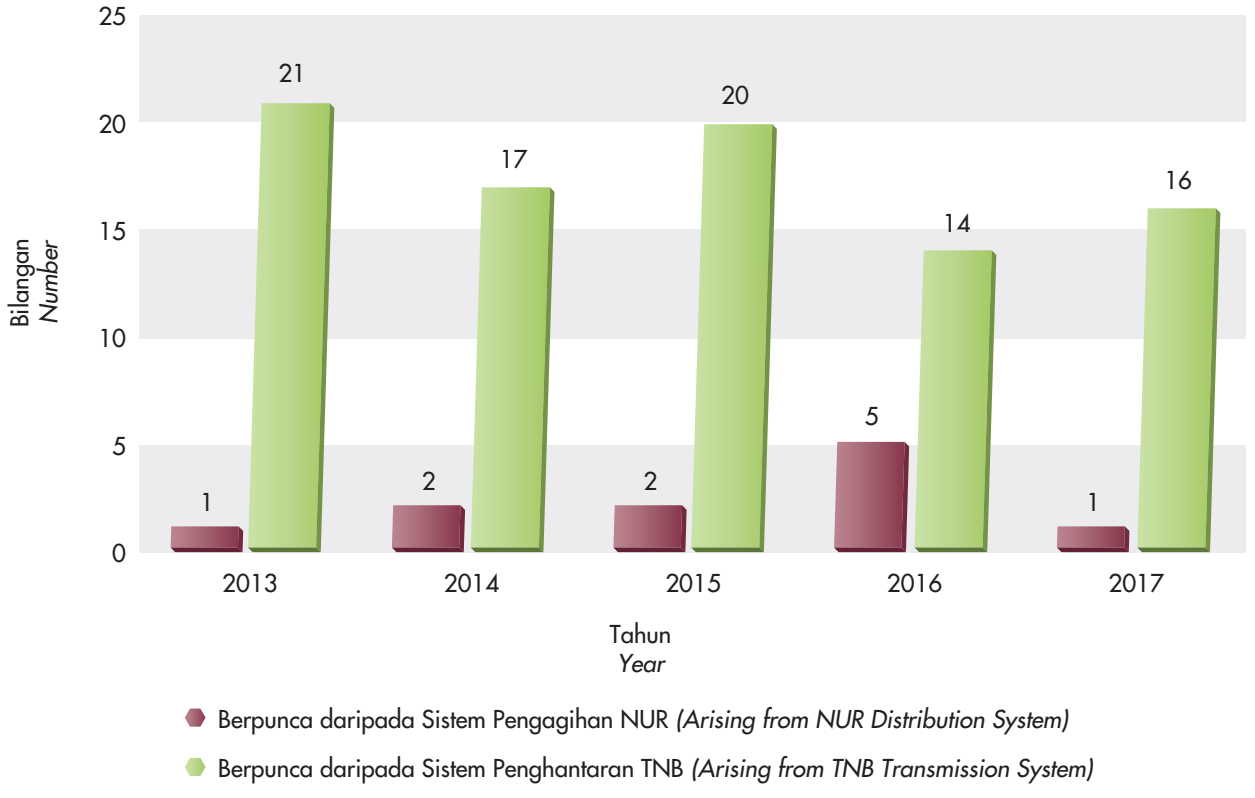


Beban Lampau *(Overload)* 34.09% 1
Peralatan Rosak *(Faulty Equipment)* 36.36% 2
Pelaksanaan kerja *(Execution of work)* 13.64% 3
Kerosakan oleh pihak ketiga *(Damage by third party)* 15.91% 4

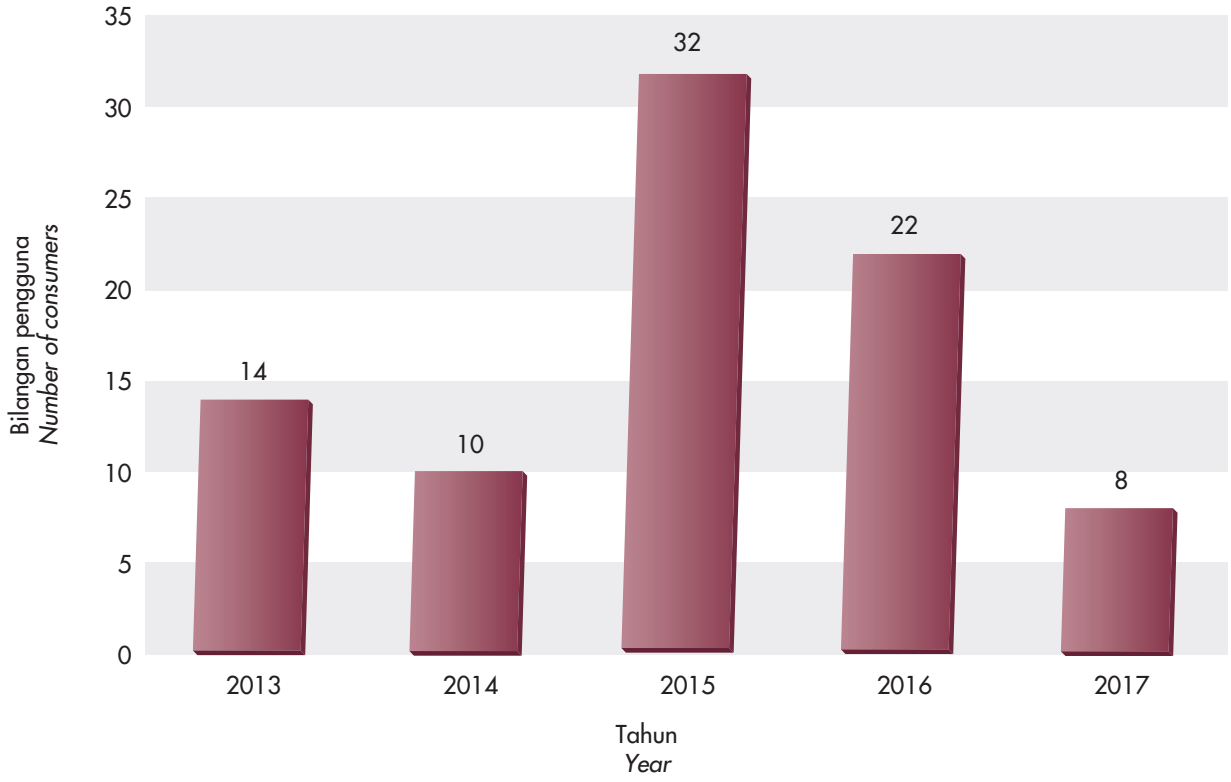
System average interruption duration index (SAIDI) bagi NUR
System average interruption duration index (SAIDI) of NUR



Kejadian junaman voltan yang dilaporkan di Kulim Hi-Tech Park (KHTP)
Voltage dip incidents reported in Kulim Hi-Tech Park (KHTP)



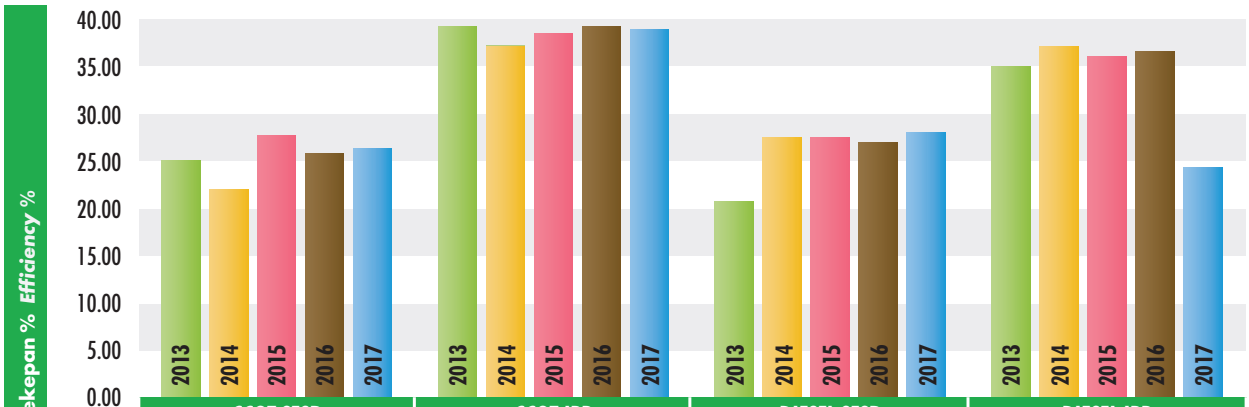
Bilangan pengguna NUR terlibat dengan insiden junaman voltan
Number of NUR consumers involved in voltage dip incidents



MAKLUMAT PRESTASI SABAH

PERFORMANCE INFORMATION OF SABAH

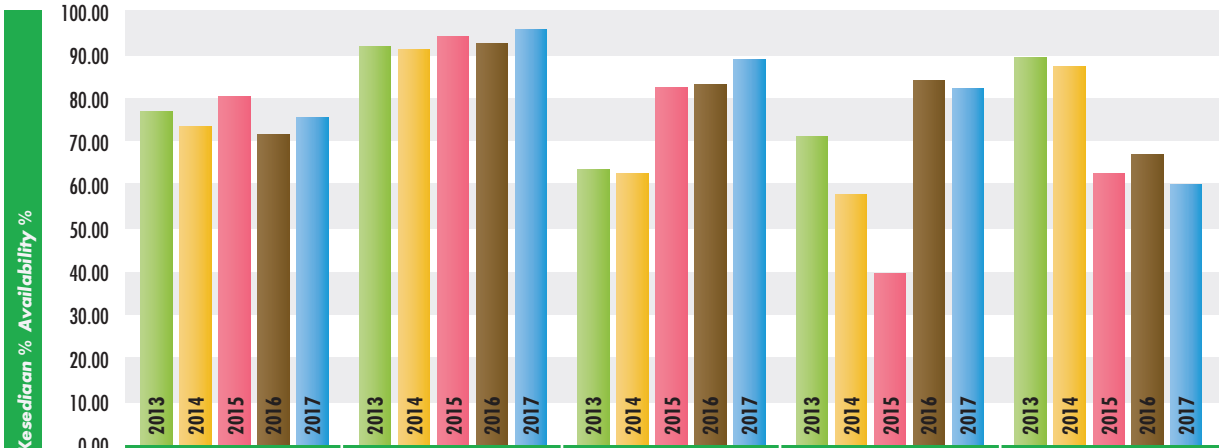
Purata kecekapan *thermal* mengikut jenis loji jana kuasa di Sabah
Average thermal efficiency by type of power plants in Sabah



	CCGT SESB	CCGT IPP	DIESEL SESB	DIESEL IPP
2013	25.07	39.25	20.72	35.06
2014	21.93	37.27	27.53	37.14
2015	27.70	38.54	27.47	36.13
2016	25.75	39.22	26.97	36.66
2017	26.27	38.98	28.01	24.35

Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Purata faktor kesediaan setara (EAF) mengikut jenis loji jana kuasa di Sabah
Average equivalent availability factor (EAF) by type of power plants in Sabah

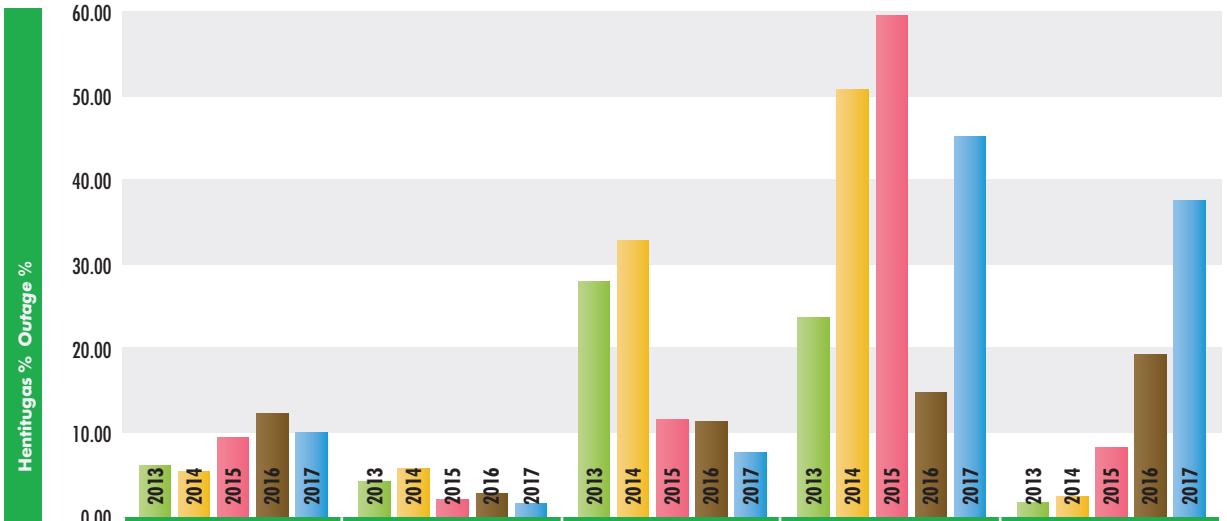


	CCGT SESB	CCGT IPP	DIESEL SESB	DIESEL IPP	HYDRO SESB
2013	76.96	91.95	63.43	71.21	89.24
2014	73.50	91.17	62.85	57.96	87.30
2015	80.36	94.10	82.37	39.46	62.69
2016	71.70	92.55	83.14	84.08	67.05
2017	75.52	95.71	88.90	82.13	59.98

Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Purata faktor hentitugas tidak berjadual (EUOF) mengikut jenis loji jana kuasa di Sabah

Average equivalent unplanned outage factor (EUOF) by type of power plants in Sabah



	CCGT SESB	CCGT IPP	DIESEL SESB	DIESEL IPP	HYDRO SESB
2013	6.11	4.24	27.91	23.66	1.71
2014	5.37	5.77	32.75	50.72	2.38
2015	9.42	2.05	11.55	59.56	8.17
2016	12.27	2.74	11.31	14.79	19.23
2017	10.00	1.55	7.62	45.16	37.61

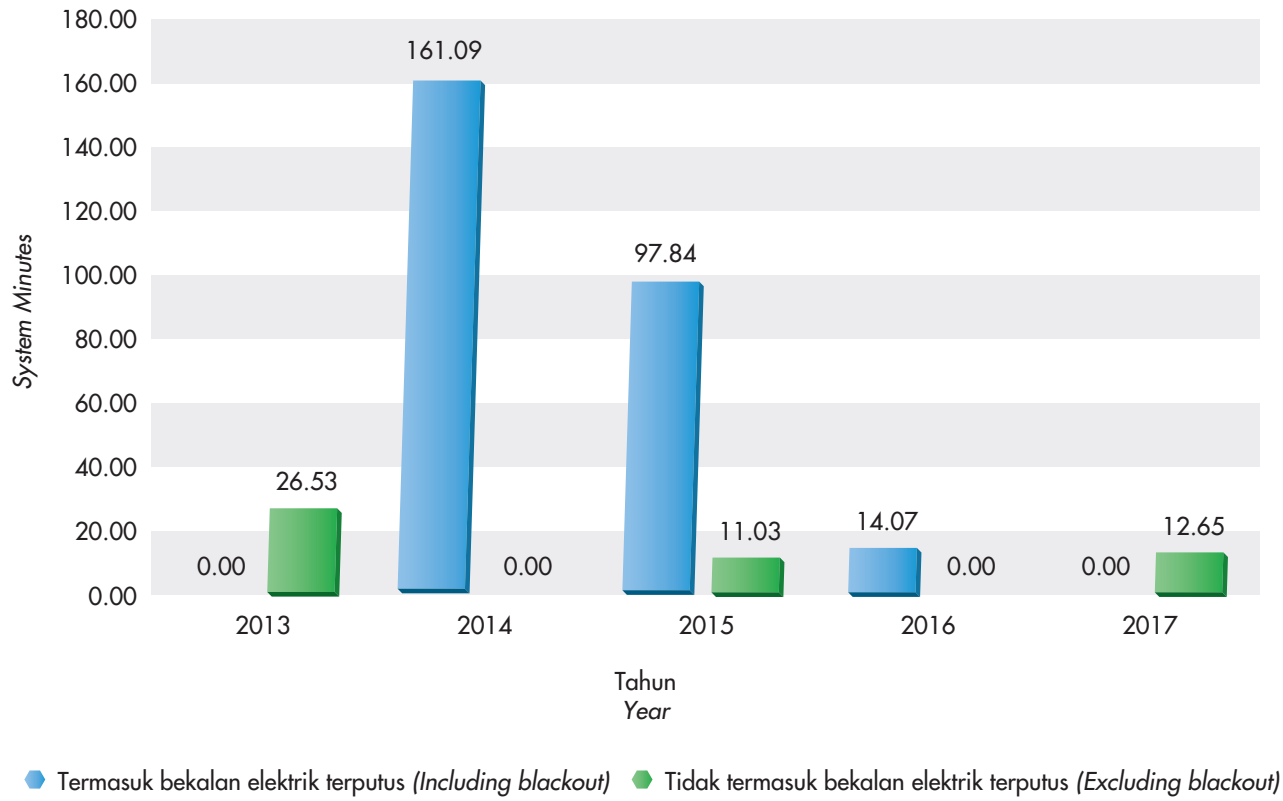
Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Jadual 14: Pelantikan sistem penghantaran dengan kehilangan beban sebanyak 50 MW dan ke atas di Sabah

Table 14: Transmission system trippings with load loss of 50 MW and above in Sabah

	2017											
PETUNJUK ***INDICATOR***	**JAN** ***JAN***	**FEB** ***FEB***	**MAC** ***MAR***	**APR** ***APR***	**MEI** ***MAY***	**JUN** ***JUN***	**JUL** ***JUL***	**OGOS** ***AUG***	**SEPT** ***SEPT***	**OKT** ***OCT***	**NOV** ***NOV***	**DIS** ***DEC***
Bilangan pelantikan tanpa lucutan beban *Number of trippings without load shedding*	9	1	7	5	5	2	1	5	12	5	5	4
Bilangan pelantikan dengan lucutan beban *Number of trippings with load shedding*	0	1	0	0	1	0	0	0	0	1	0	1
Kehilangan beban maksimum (MW) *Maximum load losses (MW)*	-	71.38	-	-	57.39	-	-	-	-	77.4	-	131.03
Tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Unsupplied energy during trippings (MWh)*	-	3,072.39	-	-	4,566.1	-	-	-	-	232.2	-	1,441.33
Purata tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Average unsupplied energy during trippings (MWh)*	-		-	-		-	-	-	-	-	-	-
Purata tempoh setiap pelantikan (jam:minit) *Average duration per tripping (hour:minutes)*	-	2:21	-	-	2:32	-	-	-	-	0:03	-	0:11
Tenaga tidak dibekalkan semasa lucutan beban (MWj) *Unsupplied energy during load shedding (MWh)*	-	-	-	-	-	-	-	-	-	-	-	-

Delivery point unreliability index (DePUI) - System minutes di Sabah
Delivery point unreliability index (DePUI) - System minutes in Sabah

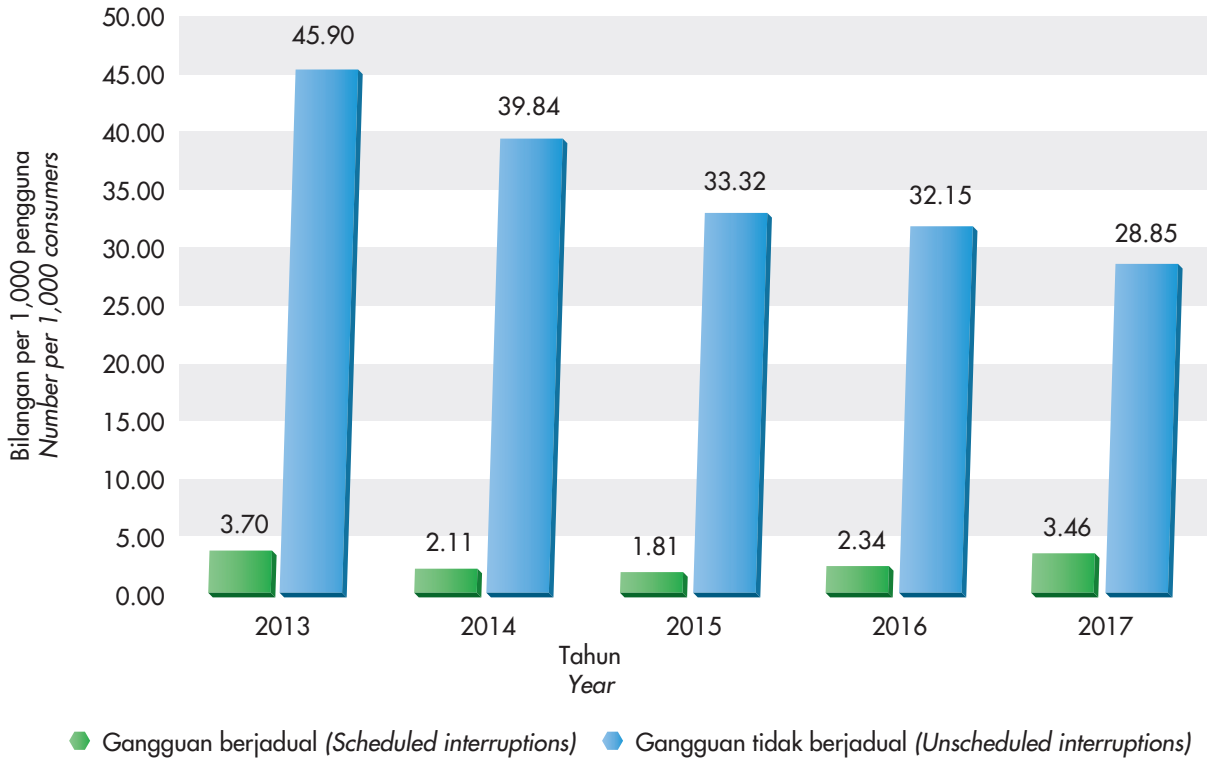


Nota: *Notes:*
Tahun Kewangan *Financial Year Data*

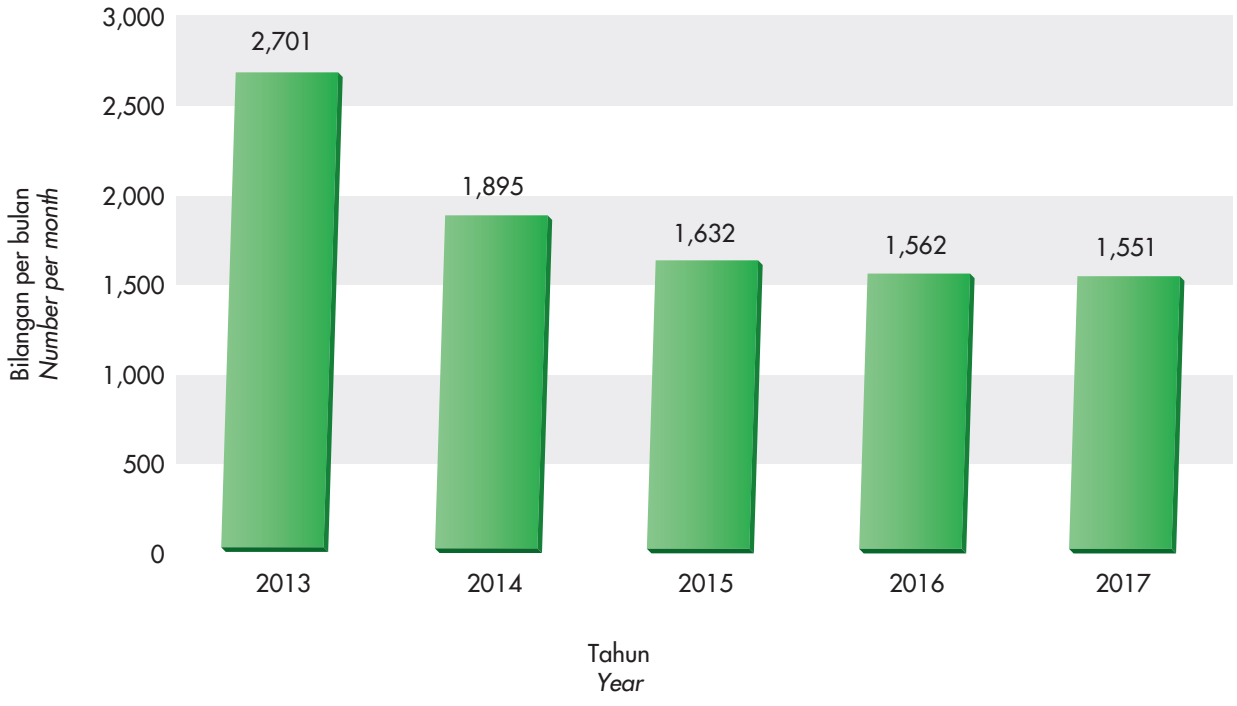
Jadual 15: Insiden pelantikan bagi talian/kabel per 100 cct-km mengikut tahap voltan (dengan kehilangan beban) di Sabah
Table 15: Tripping incidents for lines/cables per 100 cct-km by voltage level (with load loss) in Sabah

TAHAP VOLTAN *VOLTAGE LEVEL*	2013	2014	2015	2016	2017
275 kV	0.00	0.00	0.00	0.00	0.00
132 kV	0.42	0.58	0.99	0.31	0.62
66 kV	4.46	0.00	5.89	4.21	3.17

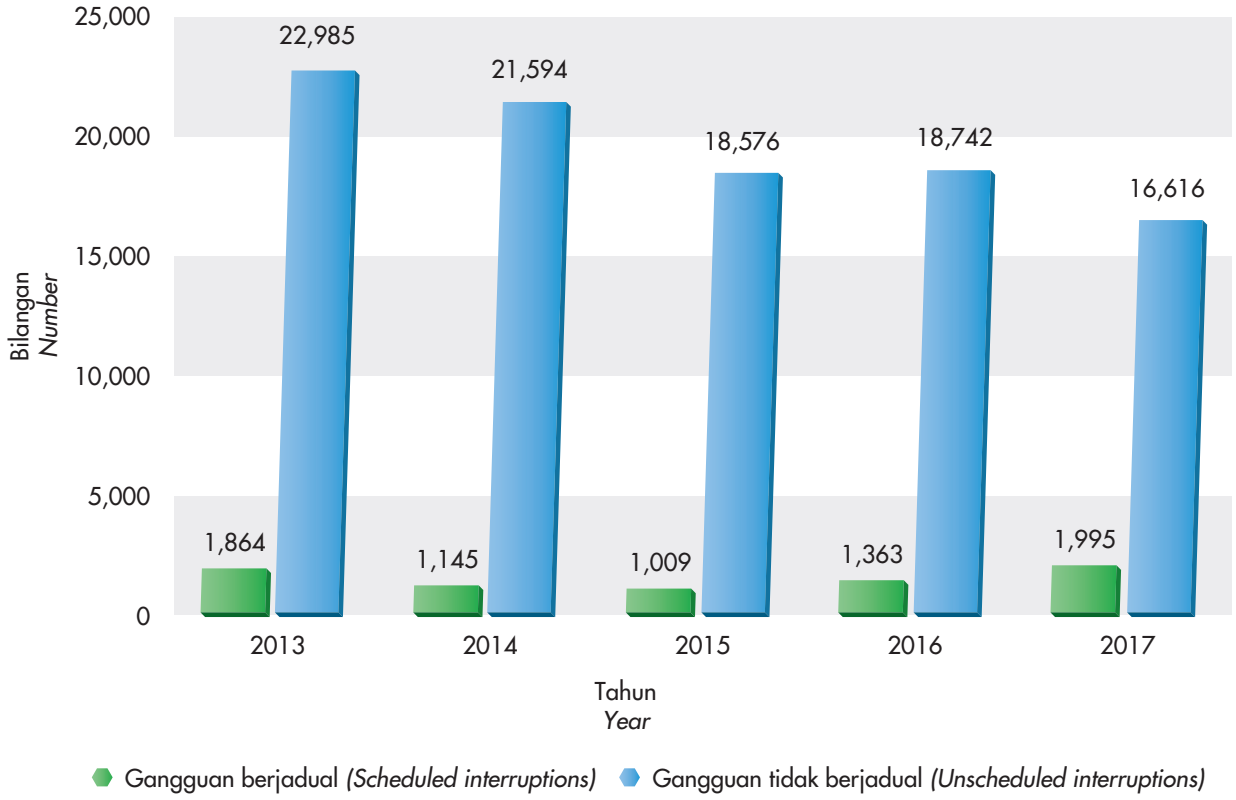
Gangguan bekalan elektrik per 1,000 pengguna di Sabah
Electricity supply interruptions per 1,000 consumers in Sabah



Purata gangguan bekalan elektrik bulanan di Sabah
Monthly average electricity supply interruptions in Sabah



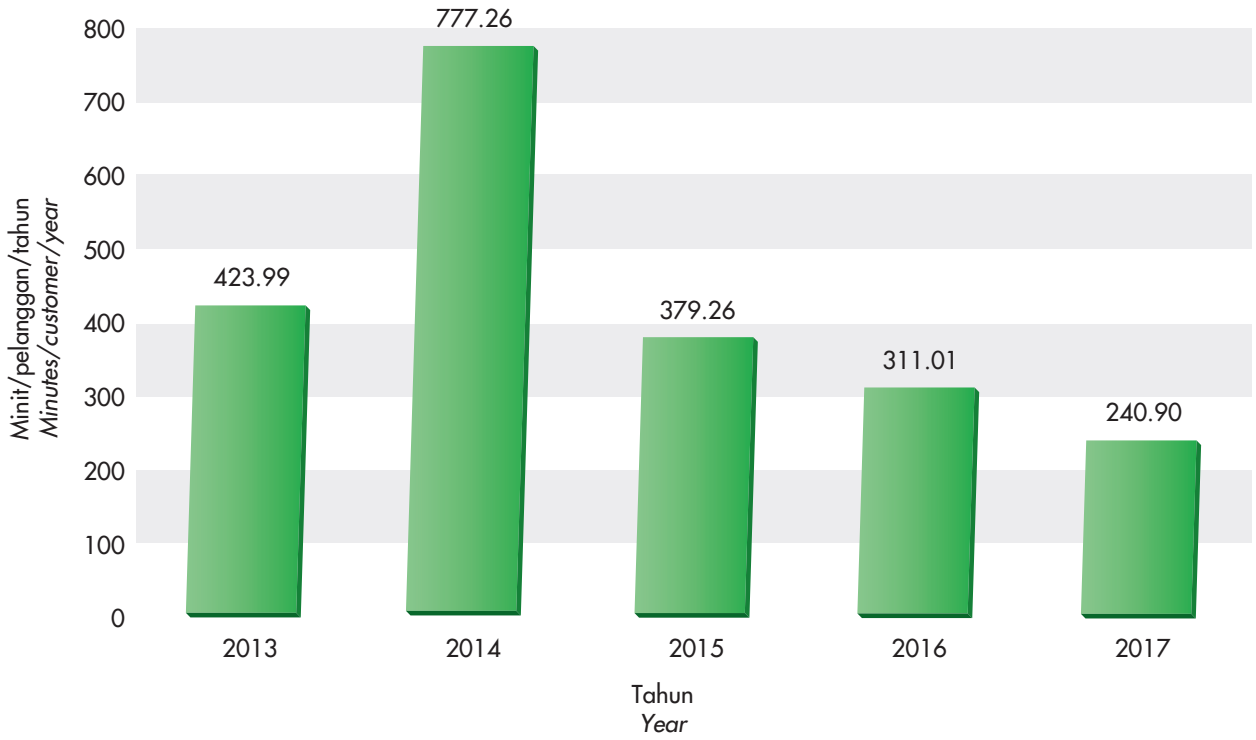
Bilangan gangguan bekalan elektrik di Sabah
Number of electricity supply interruptions in Sabah



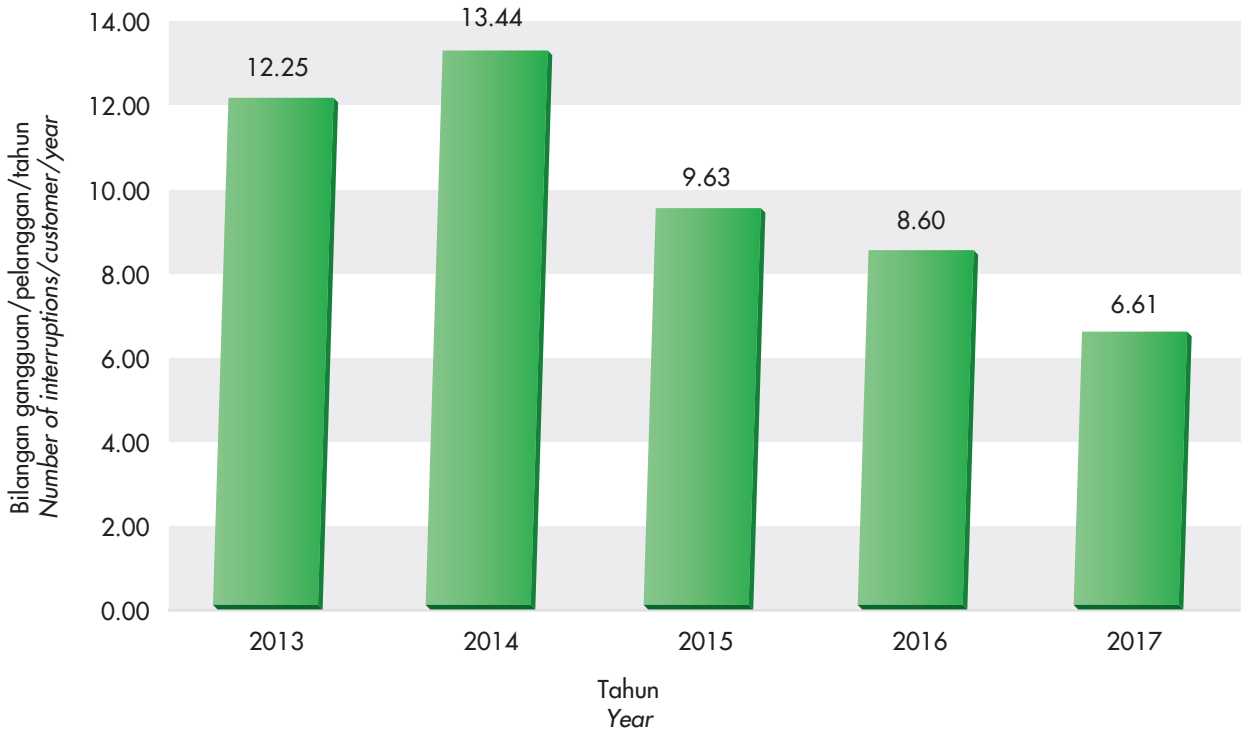
Jadual 16: Gangguan bekalan elektrik tidak berjadual mengikut jenis di Sabah
Table 16: Number of unscheduled electricity supply interruptions by type in Sabah

JENIS GANGGUAN *TYPE OF INTERRUPTIONS*	2013	2014	2015	2016	2017
Banjir *Flood*	16	16	7	3	163
Beban lampau *Overload*	3,444	3,317	2,209	2,929	3,018
Binatang *Animal*	1,451	1,445	1,171	977	1,017
Hubungan tidak baik *Poor contact*	3,224	2,977	3,168	2,959	2,182
Cuaca buruk (angin, ribut, petir) *Bad weather (wind, storm, lightning)*	2,416	2,185	1,415	1,191	1,048
Disebabkan oleh pihak lain (kena langgar, khianat, kena curi dan penyambungan haram) *Caused by other parties (hit, treachery, theft and illegal connection)*	1,521	2,071	1,742	2,195	1,394
Kabel *Cable*	586	604	483	474	462
Kebakaran *Fire*	16	33	25	64	24
Kena guard wire/ kendur *Touched with guard wire/sagging*	1,253	1,283	837	792	499
Kerosakan peralatan *Faulty equipment*	380	255	71	82	43
Kualiti barang *Quality of material*	224	176	94	83	63
Lain-lain (tiada data, tiada operasi, tiada bekalan) *Others (unavailable data, shut down, no supply)*	0	1,368	2,275	2,968	1,652
Lanjut usia / reput *Old/decayed*	855	726	1,111	595	490
Pencawang *Substation*	666	547	495	441	426
Pokok *Tree*	4,542	4,126	3,185	2,370	3,038
Tanah runtuh *Landslide*	41	104	33	22	34
Tidak diketahui *Unknown*	2,055	0	0	0	0
Ubahtika *Transient*	295	361	255	597	1,063
JUMLAH ***TOTAL***	**22,985**	**21,594**	**18,576**	**18,742**	**16,616**

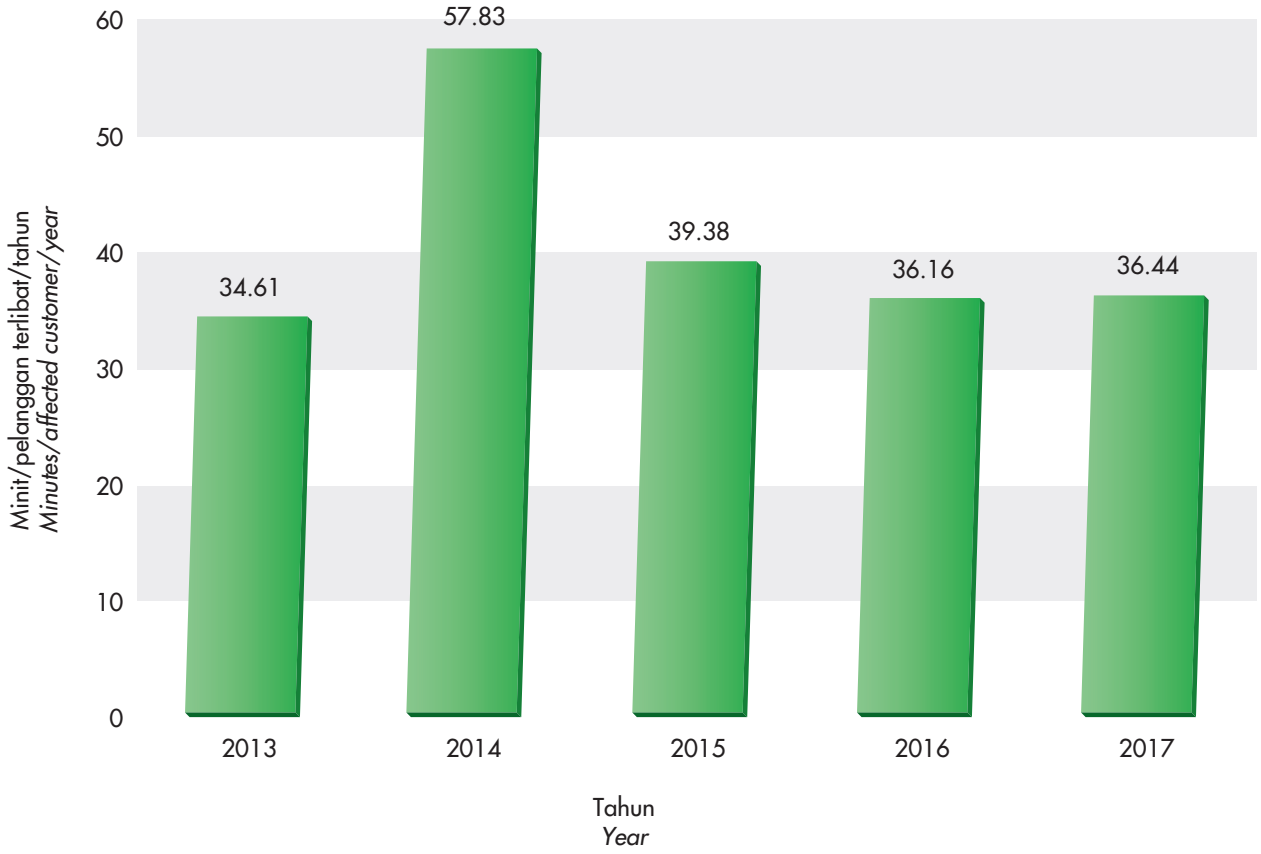
System average interruption duration index (SAIDI) di Sabah
System average interruption duration index (SAIDI) in Sabah



System average interruption frequency index (SAIFI) di Sabah
System average interruption frequency index (SAIFI) in Sabah



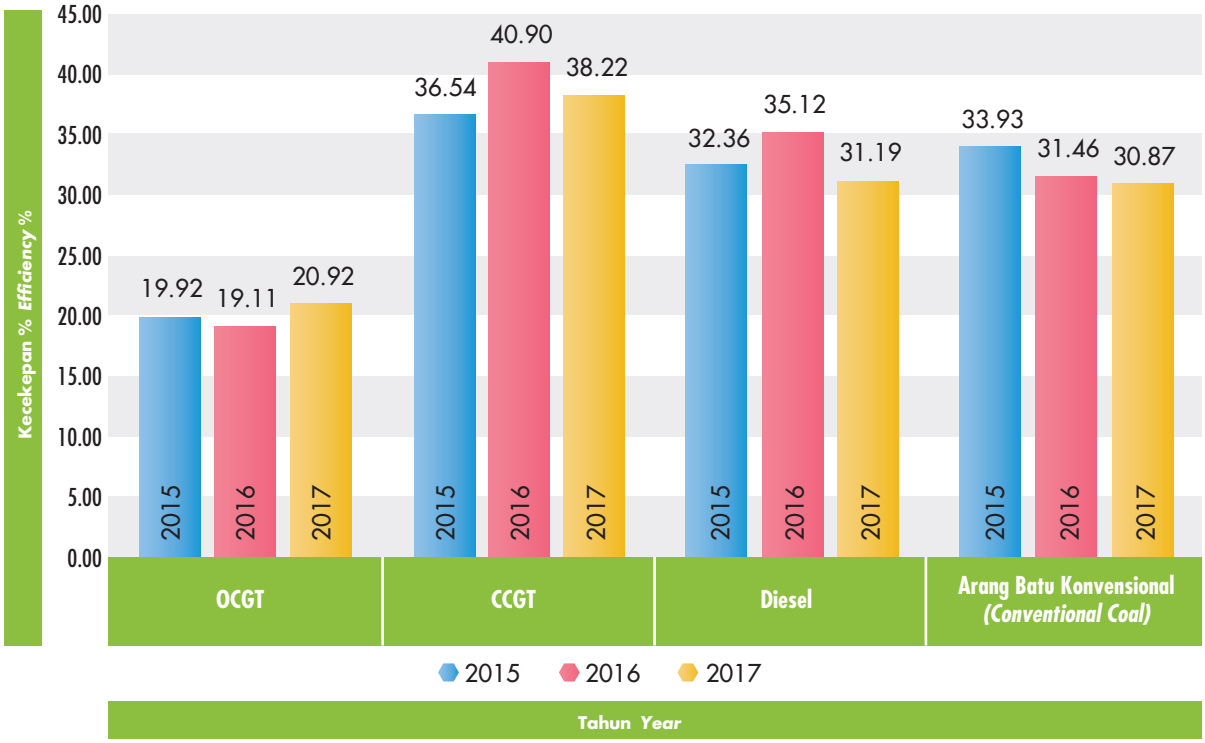
Customer average interruption duration index (CAIDI) di Sabah
Customer average interruption duration index (CAIDI) in Sabah



MAKLUMAT PRESTASI SARAWAK

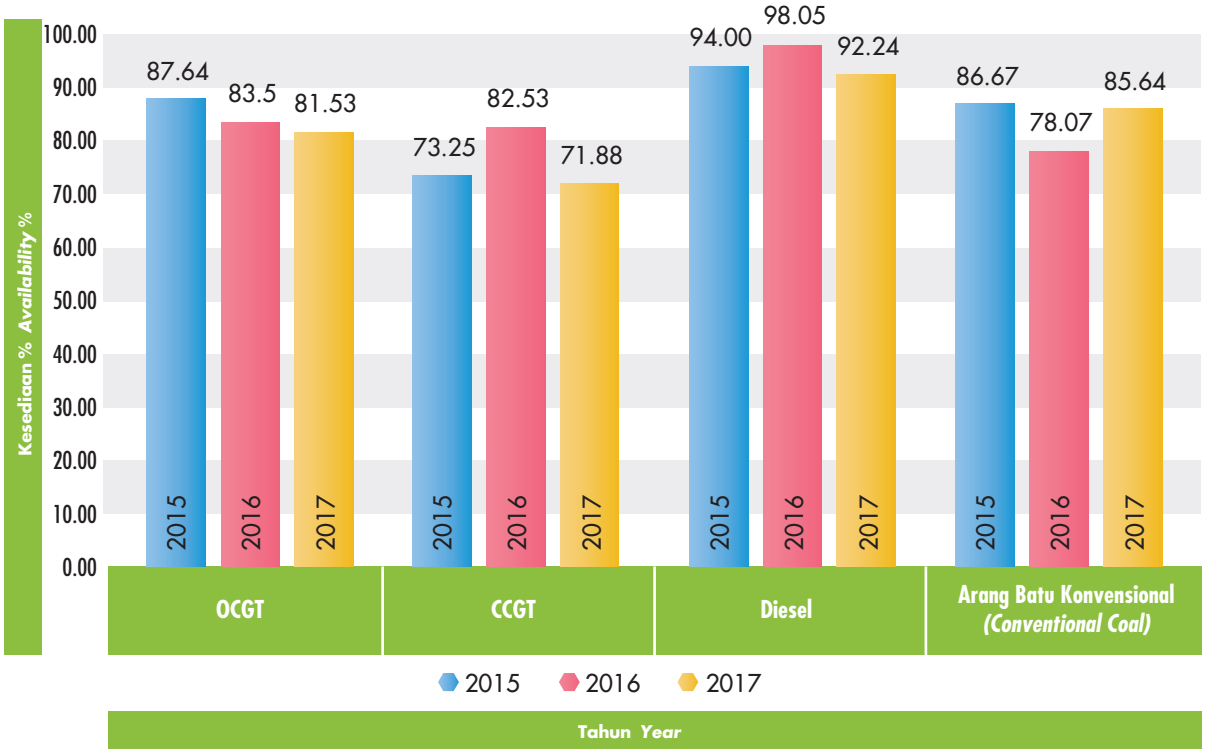
PERFORMANCE INFORMATION OF SARAWAK

Purata kecekapan *thermal* mengikut jenis loji jana kuasa di Sarawak
Average thermal efficiency by type of power plants in Sarawak



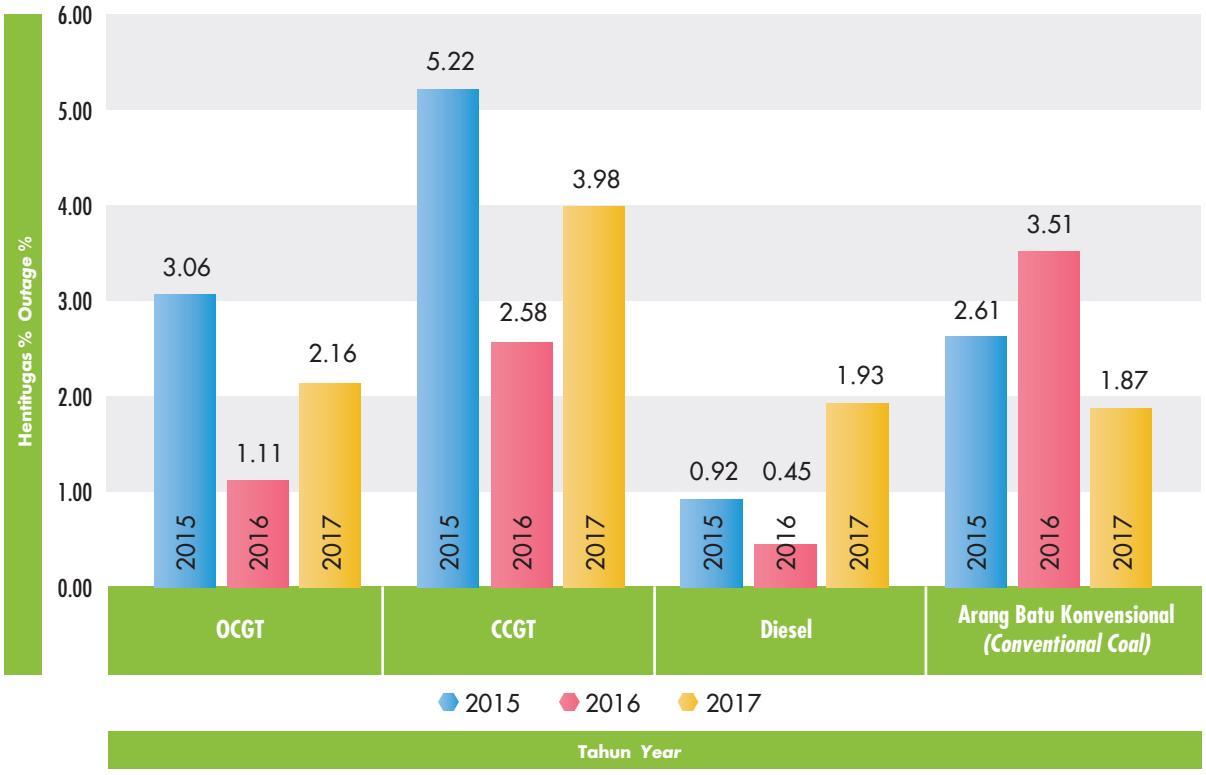
Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Purata faktor kesediaan setara (EAF) mengikut jenis loji jana kuasa di Sarawak
Average equivalent availability factor (EAF) by type of power plants in Sarawak



Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Kadar hentitugas tidak berjadual (FOR) mengikut jenis loji jana kuasa di Sarawak
Forced outage rate (FOR) by type of power plants in Sarawak

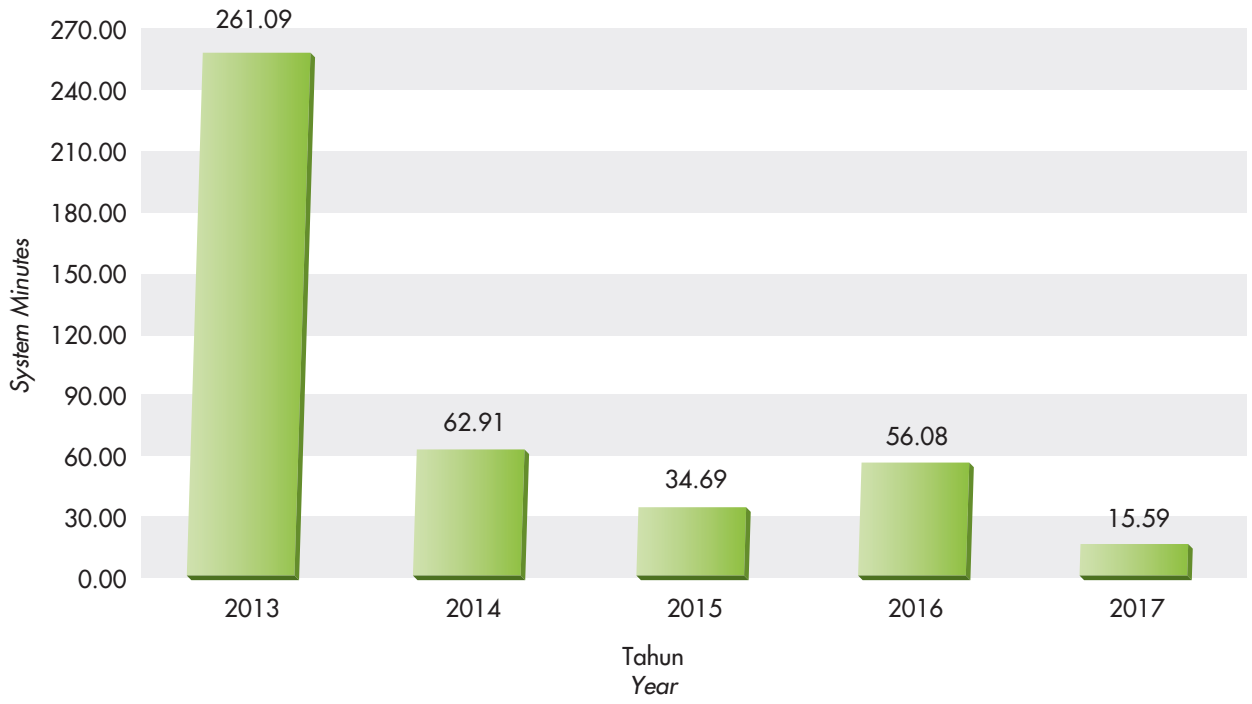


Nota: *Notes:* CCGT: Turbin gas kitar padu *Combined cycle gas turbine* OCGT: Turbin gas kitar terbuka *Open cycle gas turbine*

Jadual 17: Petunjuk prestasi penghantaran di Sarawak
Table 17: Transmission system performance indicators in Sarawak

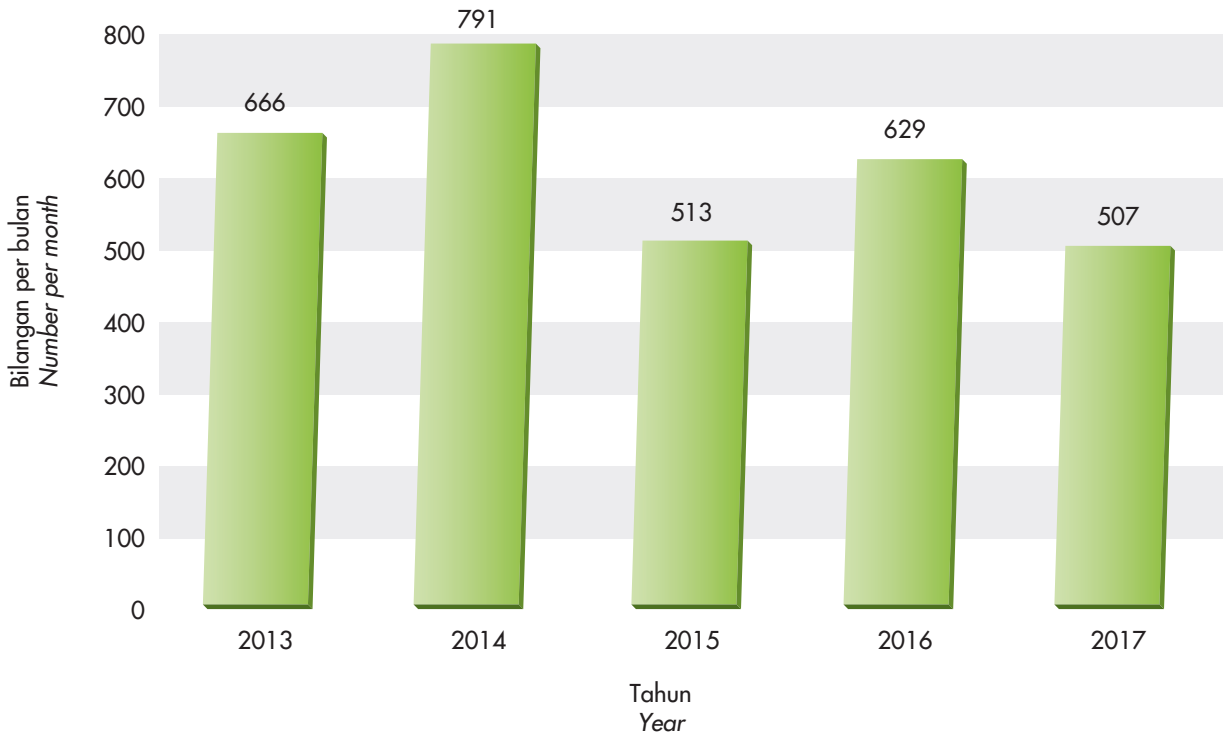
PETUNJUK *INDICATOR*	2017											
	JAN *JAN*	FEB *FEB*	MAC *MAR*	APR *APR*	MEI *MAY*	JUN *JUN*	JUL *JUL*	OGOS *AUG*	SEPT *SEPT*	OKT *OCT*	NOV *NOV*	DIS *DEC*
Bilangan pelantikan *Number of trippings*	-	2	2	1	-	1	1	3	2	1	3	-
Kehilangan beban maksimum (MW) *Maximum load losses (MW)*	-	349.39	26.83	56	-	0.5	13	32	184.64	7.19	141.82	-
Tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Unsupplied energy during trippings (MWh)*	-	298.33	11.1	82.13	-	0.94	14.73	33.26	110.21	3.83	128.03	-
Purata tenaga tidak dibekalkan setiap pelantikan (MWj) *Average unsupplied energy during trippings (MWh)*	-	149.17	5.55	82.13	-	0.94	14.73	11.09	55.11	3.83	42.68	-
Purata tempoh setiap pelantikan (Minit) *Average duration per tripping (Minutes)*	-	127	35.5	88	-	113	68	42.33	57.5	32	85.26	-
Bilangan lucutan beban *Number of load shedding*	-	-	-	-	-	-	-	-	-	-	-	-
Tenaga tidak dibekalkan semasa lucutan beban (MWj) *Unsupplied energy during load shedding (MWh)*	-	-	-	-	-	-	-	-	-	-	-	-

Delivery point unreliability index (DePUI) - *System minutes* di Sarawak
Delivery point unreliability index (DePUI) - System minutes in Sarawak

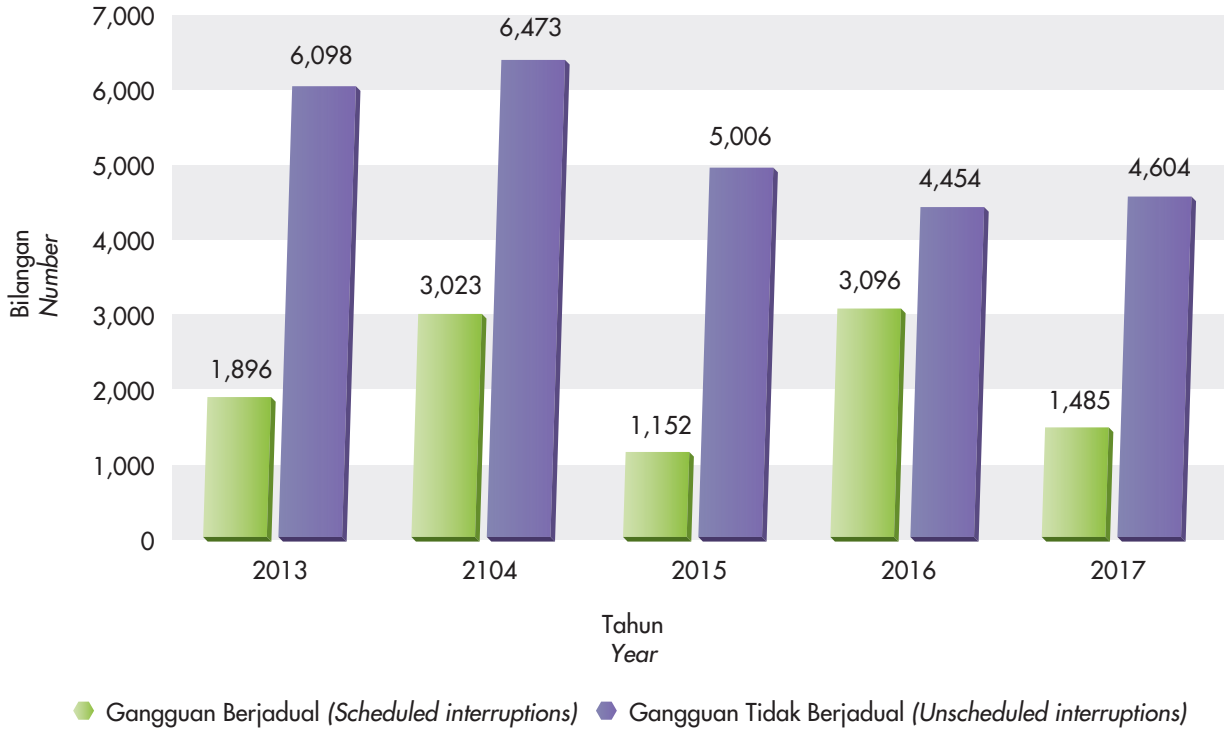


Nota: *Notes:*
Tahun Kewangan *Financial Year*

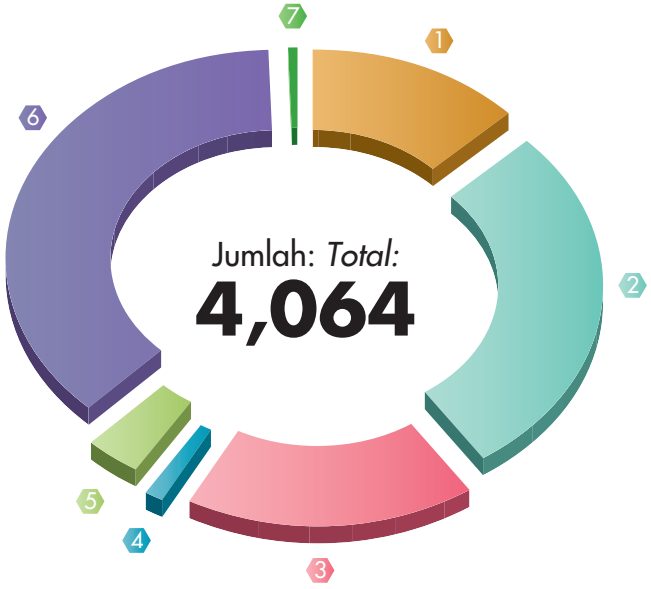
Purata gangguan bekalan elektrik bulanan di Sarawak
Monthly average electricity supply interruptions in Sarawak



Bilangan gangguan bekalan elektrik di Sarawak
Number of electricity supply interruptions in Sarawak

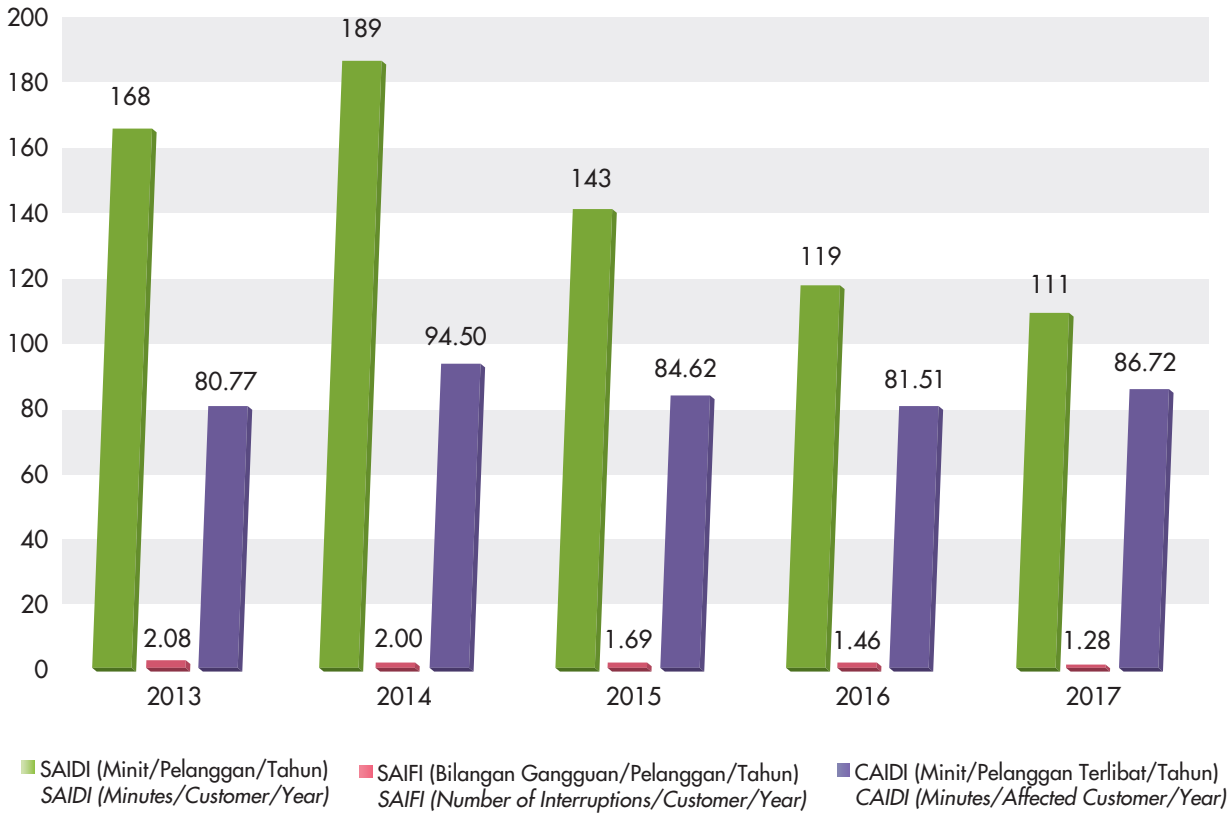


Gangguan bekalan elektrik tidak berjadual mengikut jenis gangguan di Sarawak
Number of unscheduled electricity supply interruptions by type of interruptions in Sarawak



Kerosakan peralatan *(Faulty Equipment)* **12.90%** 1
Bencana alam *(Natural disaster)* **27.76%** 2
Kerosakan oleh pihak ketiga *(Damage by third party)* **17.27%** 3
Operasi *(Operational)* **1.06%** 4
Lain-lain (Others) **3.48%** 5
Ubahtika (Transient) **37.12%** 6
Beban lampau (Overload) **0.41%** 7

System average interruption duration index (SAIDI), *System average interruption frequency index* (SAIFI) & *Customer average interruption duration index* (CAIDI) di Sarawak
System average interruption duration index (SAIDI), System average interruption frequency index (SAIFI) & Customer average interruption duration index (CAIDI) in Sarawak



MAKLUMAT DAN STATISTIK SEMENANJUNG MALAYSIA

INFORMATION AND STATISTICS OF PENINSULAR MALAYSIA

Jadual 18: Maklumat utama prestasi Tenaga Nasional Berhad (TNB)
Table 18: Key information on Tenaga Nasional Berhad (TNB) performance

PETUNJUK *INDICATOR*	UNIT	2013	2014	2015	2016	2017
Kehendak maksimum *Maximum demand*	MW	16,562	16,901	16,822	17,788	17,790
Jumlah unit penjanaan[1] *Total units generated[1]*	GWj *GWh*	24,914	28,409	27,374	24,046	22,239
Jumlah unit jualan[2] *Total units sold[2]*	GWj *GWh*	100,999	103,448	105,562	110,199	110,567
Hasil jualan elektrik *Sales revenue of electricity*	RM Juta *RM Million*	33,857	40,202	41,646	43,583	43,703
Kapasiti terpasang[3] *Installed capacity[3]*	MW	6,866	6,373	6,299	6,107	5,067
Jumlah kakitangan[4] *Number of employees[4]*	Orang *Person*	29,269	30,065	29,602	28,807	27,990
Hasil jualan elektrik per kakitangan *Sales revenue of electricity per employee*	RM Juta/Kakitangan *RM Million/ Employee*	1.16	1.34	1.41	1.51	1.56
Unit jualan per kakitangan *Units sold per employee*	GWj/Kakitangan *GWh/Employee*	3.45	3.44	3.57	3.83	3.95
Kapasiti terpasang per kakitangan *Installed capacity per employee*	MW/Kakitangan *MW/Employee*	0.23	0.21	0.21	0.21	0.18
Jumlah unit pembelian[5] *Total purchased units[5]*	GWj *GWh*	86,767	86,335	87,816	97,839	99,899
Jumlah unit eksport[6] *Total exported units[6]*	GWj *GWh*	17	17	3	0.74	4.81
Jumlah unit import[6] *Total imported units[6]*	GWj *GWh*	220	22	13	30	7.41

Nota: *Notes:*
[1] Jumlah unit penjanaan bagi TNB tidak termasuk IPP di Semenanjung Malaysia
Total units generated for TNB excluding IPPs in Peninsular Malaysia
[2] Tidak termasuk eksport
Excluding Export
[3] Kapasiti terpasang bagi TNB tidak termasuk penjana-penjana bebas (IPP) dan stesen-stesen jana kuasa hidro mini yang *off-grid*
Installed capacity of TNB excludes independent power producers and off-grid mini hydro power stations
[4] Tidak termasuk anak syarikat milik penuh TNB dan anak syarikat dengan pemilikan majoriti
Excludes TNB wholly owned subsidiaries and TNB majority owned subsidiaries
[5] Unit yang dibeli daripada IPP
Units purchased from IPP
[6] *Single Buyer Department, TNB*

Jadual 19: Kapasiti terpasang (MW) & ketersediaan keseluruhan TNB
Table 19: TNB installed capacity (MW) & overall availability

SUMBER TENAGA *ENERGY SOURCE*	2013	2014	2015	2016	2017
Hidro *Hydro*	1,911	1,899	2,149	2,529	2,536
Gas asli *Natural gas*	4,955	4,474	4,150	3,578	2,531
Medium fuel oil / diesel / distillate	-	-	-	-	-
JUMLAH *TOTAL*	**6,866**	**6,373**	**6,299**	**6,107**	**5,067**
Kebolehdapatan keseluruhan *Overall availlability*	**92.4%**	**86.7%**	**89.9%**	**94.78%**	**91.37%**

Nota: *Notes:*
Tidak termasuk kapasiti hidro mini TNB yang *off-grid*
Excludes generation from off-grid TNB mini hydro

Jadual 20: Campuran penjanaan TNB (GWj)
Table 20: TNB generation mix (GWh)

SUMBER TENAGA *ENERGY SOURCE*	2013	2014	2015	2016	2017
Hidro *Hydro*	5,392	4,111	5,007	3,838	7,089
Gas asli *Natural gas*	19,394	24,298	22,367	20,208	15,149
Medium fuel oil / diesel / distillate	128	-	-	1	2
JUMLAH *TOTAL*	**24,914**	**28,409**	**27,374**	**24,046**	**22,239**

Nota: *Notes:*
Tidak termasuk penjanaan daripada hidro mini TNB yang *off-grid*
Excludes generation from off-grid TNB mini hydro

Jadual 21: Bilangan pengguna TNB
Table 21: Number of TNB consumers

TAHUN *YEAR*	2013	2014	2015	2016	2017
Domestik *Domestic*	6,503,417	6,710,032	6,920,122	6,989,968	7,181,846
Komersil *Commercial*	1,334,856	1,404,501	1,475,306	1,464,815	1,510,341
Industri *Industry*	27,954	24,852	27,672	27,556	28,867
Lampu awam *Public lighting*	61,121	63,340	65,888	67,808	70,402
Perlombongan *Mining*	27	29	28	34	38
Pertanian *Agriculture*	1,494	1,574	1,627	1,808	2,112
Unit percuma *Free units*	2,406	2,385	2,414	2,529	2,559
JUMLAH *TOTAL*	**7,931,275**	**8,206,713**	**8,493,057**	**8,554,519**	**8,796,165**

Nota: *Notes:*
Unit Percuma merupakan bekalan elektrik yang tidak dikenakan bayaran bil bulanan. Premis yang layak merupakan premis-premis TNB termasuk bangunan pejabat, rumah kelab, kuarters, pencawang masuk utama, pencawang pembahagian utama dan pencawang elektrik.
Free Units refer to electricity provided for free without being charged for monthly bill payments. Eligible premises are TNB premises including office buildings, clubhouse, quarters, main substations, transmission substations and distribution substations.

Jadual 22: Jualan tenaga elektrik TNB (GWj)
Table 22: TNB electricity sales (GWh)

TAHUN *YEAR*	2013	2014	2015	2016	2017
Domestik *Domestic*	21,601	22,350	23,231	25,745	24,828
Komersil *Commercial*	34,878	35,801	36,645	39,447	39,086
Industri *Industry*	42,721	43,380	43,754	42,977	44,457
Lampu awam *Public lighting*	1,302	1,370	1,357	1,374	1,482
Perlombongan *Mining*	121	133	105	113	131
Pertanian *Agriculture*	375	414	467	543	583
Eksport *Export*	17	17	3	0.74	4.81
JUMLAH *TOTAL*	**101,015**	**103,465**	**105,562**	**110,199**	**110,572**

Jadual 23: Penggunaan tenaga elektrik (GWj) mengikut negeri di Semenanjung Malaysia
Table 23: Electricity consumption (GWh) by state in Peninsular Malaysia

NEGERI *STATE*	2010	2011	2012	2013	2014	2015	2016	2017
Perlis	629	655	704	732	745	763	790	750
Kedah	4,404	4,454	4,689	4,772	4,881	5,002	5,040	5,235
Penang	10,116	10,292	10,510	10,782	10,955	10,903	11,375	11,425
Perak	7,016	7,182	7,585	7,915	8,252	8,516	9,057	8,936
Selangor	24,245	25,312	25,937	27,376	27,931	28,152	29,269	28,853
Kuala Lumpur	12,508	12,857	13,398	13,998	14,267	14,470	15,196	15,186
Negeri Sembilan	4,849	5,036	5,187	5,353	5,653	5,762	5,938	5,979
Melaka	3,415	3,765	3,935	4,054	4,164	4,311	4,486	4,625
Johor	13,881	14,344	14,927	15,470	16,119	16,737	17,527	17,807
Pahang	4,108	4,255	4,472	4,640	4,724	4,776	5,052	5,187
Terengganu	2,979	2,760	2,979	2,773	2,555	2,876	2,763	2,953
Kelantan	1,697	1,747	1,878	2,028	2,068	2,099	2,352	2,375
Putrajaya	881	981	1,043	1,106	1,136	1,192	1,353	1,258
JUMLAH *TOTAL*	**90,728**	**93,640**	**97,243**	**100,999**	**103,449**	**105,560**	**110,198**	**110,567**

Jadual 24: Sistem penghantaran TNB
Table 24: TNB transmission system

TAHUN *YEAR*	2013	2014	2015	2016	2017
TALIAN & KABEL SISTEM PENGHANTARAN ***TRANSMISSION SYSTEM LINES & CABLES***					
500 kV (cct-km)	668	668	722	784	784
275 kV (cct-km)	8,534[1]	8,714[1]	9,517	9,518	9,637
132 kV (cct-km)	11,891	12,088	12,151	12,175	12,420
PENCAWANG PENGHANTARAN ***TRANSMISSION SUBSTATIONS***					
Bilangan *Number*	404	414	419	427	439
Kapasiti (MVA) *Capacity (MVA)*	95,990	99,478	103,545	104,780	109,210

Nota: *Notes:*
[1] Termasuk 627.64 cct-km talian 500 kV beroperasi pada 275 kV
Including 627.64 cct-km 500 kV lines energized at 275 kV

Jadual 25: Sistem pengagihan TNB
Table 25: TNB distribution system

TAHUN *YEAR*	2013	2014	2015	2016	2017
TALIAN & KABEL SISTEM PENGAGIHAN[1] ***DISTRIBUTION SYSTEM LINES & CABLES[1]***					
Talian atas (km) *Overhead lines (km)*	487,385	516,780	532,403	532,403	339,793
Kabel bawah tanah (km) *Underground cables (km)*	555,272	678,026	697,159	697,159	305,464
PENCAWANG PENGAGIHAN ***DISTRIBUTION SUBSTATIONS***					
Bilangan *Number*	68,509	70,286	74,417	74,417	79,450
Kapasiti (MVA) *Capacity (MVA)*	127,217	128,717	131,465	131,465[2]	111,842

Nota: *Notes:*
[1] 2013-2016: Panjang laluan *Route length*
2017: Panjang litar *Circuit length*
[2] Data diperolehi daripada Tenaga Nasional Berhad *Integrated Annual Report* 2016
Data obtained from Tenaga Nasional Berhad Integrated Annual Report 2016

Jadual 26: Kapasiti terpasang di Semenanjung Malaysia pada tahun 2017
Table 26: Installed capacity in Peninsular Malaysia in 2017

Bersambung dengan Grid Nasional *On grid*		
Stesen jana kuasa ***Power stations***	**Sumber tenaga** ***Energy source***	**Kapasiti terpasang (MW)** ***Installed capacity (MW)***
TNB		
SJ Hidroelektrik Temenggor, Bersia, Kenering, Chenderoh, Lower & Upper Piah - Sungai Perak Scheme	Hidro *Hydro*	649.10
SJ Hidroelektrik Pergau	Hidro *Hydro*	600.00
SJ Hidroelektrik Sultan Mahmud, Kenyir	Hidro *Hydro*	400.00
SJ Hidroelektrik Jor, Woh	Hidro *Hydro*	250.00
SJ Hidroelektrik Hulu Terengganu	Hidro *Hydro*	250.00
SJ Hidroelektrik Ulu Jelai	Hidro *Hydro*	372.00
SJ Hidroelektrik Tembat	Hidro *Hydro*	15.00
SJ Putrajaya (OCGT)	Gas asli *Natural gas*	253.00
SJ Sultan Ismail, Paka (CCGT)	Gas asli *Natural gas*	257.00
SJ Gelugor (CCGT)	Gas asli *Natural gas*	310.00
SJ Tuanku Jaafar, Port Dickson (CCGT)	Gas asli *Natural gas*	1,411.00
SJ Jambatan Connaught (CCGT)	Gas asli *Natural gas*	300.00
	JUMLAH *TOTAL*	**5,067.10**
Penjana bebas *Independent power producers (IPP)*		
TNB Janamanjung (1,2,3) Sdn. Bhd. (Thermal)	Arang batu *Coal*	3,080.00
TNB Janamanjung (4) Sdn. Bhd. (Thermal)	Arang batu *Coal*	
TNB Manjung Five Sdn. Bhd. (Thermal)	Arang batu *Coal*	1,000.00
Tanjung Bin Power Sdn. Bhd. (Thermal)	Arang batu *Coal*	2,100.00
Tanjung Bin Energy Sdn. Bhd. (Thermal)	Arang batu *Coal*	1,000.00
Jimah Energy Ventures Sdn. Bhd.(Thermal)	Arang batu *Coal*	1,400.00
Kapar Energy Ventures Sdn. Bhd. (Thermal)	Arang batu *Coal*	1,486.00
Kapar Energy Ventures Sdn. Bhd. (Conventional Thermal)	Gas asli/Minyak *Natural gas/Oil*	769.00
Kapar Energy Ventures Sdn. Bhd. (OCGT)	Gas asli *Natural gas*	
Powertek Berhad (OCGT)	Gas asli *Natural gas*	434.00
Port Dickson Power Berhad (OCGT)	Gas asli *Natural gas*	436.40
Pahlawan Power Sdn. Bhd. (CCGT)	Gas asli *Natural gas*	322.00
GB3 Sdn. Bhd., Lumut (CCGT)	Gas asli *Natural gas*	640.00
Panglima Power Berhad, Telok Gong (CCGT)	Gas asli *Natural gas*	720.00
Teknologi Tenaga Perlis Consortium Sdn.Bhd. (CCGT)	Gas asli *Natural gas*	650.00
Prai Power Sdn. Bhd. (CCGT)	Gas asli *Natural gas*	350.00
Kuala Langat Power Plant Sdn. Bhd. (CCGT)	Gas asli *Natural gas*	675.00
Segari Energy Ventures Sdn. Bhd.(CCGT)	Gas asli *Natural gas*	1,303.00
TNB Prai Sdn. Bhd. (CCGT)	Gas asli *Natural gas*	1,071.43
TNB Connaught Bridge Sdn. Bhd. (CCGT)	Gas asli *Natural gas*	375.00
Pengerang Power Sdn. Bhd. *(Cogeneration)*	Gas asli *Natural gas*	400.00
YTL Paka (CCGT)	Gas asli *Natural gas*	585.00
TNB Pasir Gudang Energy Sdn. Bhd.(CCGT)	Gas asli *Natural gas*	275.00
	JUMLAH *TOTAL*	**19,071.83**
	Jumlah bersambung dengan Grid Nasional Total *on grid*	**24,138.93**

Tidak bersambung dengan Grid Nasional *Off grid*		
Stesen jana kuasa ***Power stations***	**Sumber tenaga** ***Energy source***	**Kapasiti terpasang (MW)** ***Installed capacity (MW)***
Penjana bebas *Independent power producers (IPP)*		
Musteq Hydro Sdn. Bhd.	Hidro mini *Mini hydro*	20.00
NUR Generation Sdn. Bhd. (CCGT)	Gas asli *Natural gas*	220.00
	JUMLAH *TOTAL*	**240.00**
FEED-IN-*TARIFF (FiT)*[1]		
FiT- Biogas	Biogas	46.24
FiT- Biojisim *Biomass*	Biojisim *Biomass*	39.00
FiT- Solar PV	Solar	317.11
FiT- Hidro Mini *Mini hydro*	Hidro mini *Mini hydro*	23.80
	JUMLAH *TOTAL*	**426.15**
TNB - HIDRO MINI *MINI HYDRO*		
Odak, Habu, Kg Raja, Kg Terla dan Robinson Falls (Skim Cameron Highlands *Scheme*)	Hidro mini *Mini hydro*	11.90
Sungai Perdak, Pahang	Hidro mini *Mini hydro*	0.27
Sungai Bil, Perak	Hidro mini *Mini hydro*	0.23
Sungai Kinjang, Perak	Hidro mini *Mini hydro*	0.33
Sungai Asap, Perak	Hidro mini *Mini hydro*	0.11
Sungai Kenas, Perak	Hidro mini *Mini hydro*	0.50
Sungai Chempias, Perak	Hidro mini *Mini hydro*	0.12
Sungai Tebing Tinggi, Perak	Hidro mini *Mini hydro*	0.15
Sungai Tawar Besar, Kedah	Hidro mini *Mini hydro*	0.55
Sungai Mahang, Kedah	Hidro mini *Mini hydro*	0.45
Sungai Mempelam, Kedah	Hidro mini *Mini hydro*	0.38
Sungai Sok, Kelantan	Hidro mini *Mini hydro*	0.56
Sungai Renyok G1, Kelantan	Hidro mini *Mini hydro*	0.78
Sungai Renyok G2, Kelantan	Hidro mini *Mini hydro*	0.78
Sungai Cheralak, Terengganu	Hidro mini *Mini hydro*	0.48
Sungai Berang, Terengganu	Hidro mini *Mini hydro*	0.36
	JUMLAH *TOTAL*	**17.95**
COGENERATION		
Cogeneration awam *Public cogeneration*	Gas asli *Natural gas*	459.63
	Haba buangan proses perindustrian *Industrial process waste heat*	13.00
	JUMLAH *TOTAL*	**472.63**
Cogeneration persendirian *(off grid) Private cogeneration (off grid)*	Gas asli *Natural gas*	465.12
	Biojisim *Biomass*	12.41
	MFO	79.20
	Haba buangan proses perindustrian *Industrial process waste heat*	12.00
	JUMLAH *TOTAL*	**568.73**
PENJANAAN PERSENDIRIAN[2] *SELF GENERATION*[2]		
Penjanaan persendirian kurang 5 MW *(off grid) Self generation less than 5 MW (off grid)*	Diesel	399.04
	Biojisim *Biomass*	351.79
	Solar PV	1.00
	Biogas	4.85
	Hidro mini *Mini Hydro*	2.13
	JUMLAH *TOTAL*	**758.81**
	SOLAR BERSKALA BESAR *LARGE SCALE SOLAR (LSS)*	**10.00**
	JUMLAH *TOTAL*	**10.00**
	Jumlah tidak bersambung dengan Grid Nasional Total *Off grid*	**2,494.27**
	JUMLAH BESAR *GRAND TOTAL*	**26,633.20**

Nota: *Notes:* [1] Data diperolehi daripada *Data obtained from* Sustainable Energy Development Authority (SEDA)
[2] Data tahun 2015 daripada Pejabat Kawasan ST *2015 Data from ST Regional Offices*

Jadual 27: Campuran penjanaan di Semenanjung Malaysia pada tahun 2017 (GWj)
Table 27: Generation mix in Peninsular Malaysia in 2017 (GWh)

Sumber tenaga ***Energy source***	**TNB**	**IPP**	***Feed-in-tariff* (FiT)[1]**	**Cogen (Awam *Public*)**	**Cogen (Persendirian *Private*)**	**Penjanaan persendirian[2] *Self-gen*[2]**	**JUMLAH (GWj) *TOTAL (GWh)***
Arang batu *Coal*		65,692.95					**65,692.95**
Gas asli *Natural gas*	15,148.54	34,827.32		2,895.25	516.03		**53,387.14**
MFO/Distillate/ Diesel	1.54	369.22				11.06	**381.82**
Hidro *Hydro*	7,088.63						**7,088.63**
Hidro mini *Mini hydro*	42.19		53.71			5.28	**101.18**
Biojisim *Biomass*			77.33		7.59	102.62	**187.54**
Biogas			103.45			7.14	**110.59**
Solar			286.19			0.12	**286.31**
Lain-lain (bukan TBB)[3] *Others (non-RE)*[3]					71.89	2.04	**73.93**
JUMLAH *TOTAL*	**22,280.90**	**100,889.49**	**520.68**	**2,895.25**	**595.51**	**128.26**	**127,310.09**

Nota: *Notes:*
[1] Data diperolehi daripada *Data obtained from* Sustainable Energy Development Authority (SEDA)
[2] Data tahun 2015 daripada Pejabat Kawasan ST *2015 Data from ST Regional Offices*
[3] TBB: Tenaga boleh diperbaharui *RE: Renewable energy*

Jadual 28: Penjanaan persendirian kurang 5 MW di Semenanjung Malaysia
Table 28: Less-than-5 MW self generation in Peninsular Malaysia

Pejabat Kawasan ST ***ST Regional Office***	**JOHOR**	**KELANTAN & TERENGGANU**	**NEGERI SEMBILAN & MELAKA**	**PAHANG**	**PERAK**	**PULAU PINANG, KEDAH & PERLIS**	**SELANGOR, KUALA LUMPUR & PUTRAJAYA**	**JUMLAH** ***TOTAL***
Bilangan lesen sah sehingga 31 Disember 2017 *Number of valid license as of 31 December 2017*	155	241	142	216	122	58	472	**1,406**
Kapasiti (MW) *Capacity (MW)*	23.62	87.28	78.68	250.84	70.07	60	188.33	**758.81**
Elektrik dijana (GWj) mengikut sumber tenaga ***Generated electricity by energy source (GWh)***								
Diesel		2.48	1.00	0.01	6.00	0.08	1.49	**11.06**
Biojisim *Biomass*		15.30		0.14		0.57	1.42	**102.62**
Tandan sawit kosong *Empty fruit bunches*		15.30		0.14		0.54	0.72	76.2
Tempurung & gentian kelapa sawit *Palm oil shell & fibre*							0.45	0.45
Sisa sawit *Palm oil waste*								25.69
Habuk kayu *Wood dust*							0.25	0.25
Hampas padi *Paddy husk*						0.03		0.03
Biogas								**7.14**
Efluen kilang kelapa sawit *Palm oil mill effluent*								7.14
Suria *Sun*						0.12		**0.12**
Hidro mini *Mini hydro*								**5.28**
Lain-lain *Others*	2.04							**2.04**
JUMLAH *TOTAL*	**2.04**	**17.78**	**26.69**	**0.15**	**77.92**	**0.77**	**2.91**	**128.26**

Nota: *Notes:*
Data tahun 2015 daripada Pejabat-pejabat Kawasan ST *2015 data from ST Regional Offices*

MAKLUMAT DAN STATISTIK SABAH

INFORMATION AND STATISTICS OF SABAH

Jadual 29: Maklumat utama prestasi Sabah Electricity Sdn. Bhd. (SESB)

Table 29: Key information on Sabah Electricity Sdn. Bhd. (SESB) performance

PETUNJUK *INDICATOR*	UNIT	2013	2014	2015	2016	2017
Kehendak maksimum *Maximum demand*	MW	874	908	914	945	938
Jumlah unit penjanaan *Total units generated*	GWj *GWh*	1,357	1,323	1,071	875	906
Jumlah unit jualan *Total units sold*	GWj *GWh*	4,670	4,776	5,109	5,284	5,173
Hasil jualan elektrik *Sales revenue of electricity*	RM Juta *RM Million*	1,382	1,636	1,668	1,734	1,723
Kapasiti penjanaan boleh harap *Dependable generation capacity*	MW	495	401	328	331	319
Jumlah kakitangan *Number of employees*	Orang *Person*	2,788	2,975	3,096	3,282	3,260
Hasil jualan elektrik per kakitangan *Sales revenue of electricity per employee*	RM Juta/Kakitangan *RM Million/ Employee*	0.50	0.55	0.54	0.53	0.53
Unit jualan per kakitangan *Units sold per employee*	GWj/Kakitangan *GWh/Employee*	1.68	1.61	1.65	1.58	1.59
Kapasiti terpasang per kakitangan *Installed capacity per employee*	MW/Kakitangan *MW/Employee*	0.18	0.13	0.11	0.10	0.10
Jumlah unit pembelian[1] *Total purchased units*[1]	GWj *GWh*	3,866	4,479	4,881	5,152	5,063
Jumlah unit eksport *Total exported units*	GWj *GWh*	-	-	-	-	-
Jumlah unit import *Total imported units*	GWj *GWh*	-	-	-	-	-

Nota: *Notes:*

[1] Unit yang dibeli daripada IPP
Units purchased from IPP

Jadual 30: Kapasiti penjanaan boleh harap (MW) & ketersediaan keseluruhan SESB
Table 30: SESB dependable capacity (MW) & overall availability

SUMBER TENAGA *ENERGY SOURCE*	2013	2014	2015[1]	2016[1]	2017[1]
Hidro *Hydro*	68	69.6	72.2	78.2	74.6
Gas asli *Natural gas*	105	104.5	104.5	104.5	103.4
Diesel	322	226.6	150.9	147.9	141.1
JUMLAH *TOTAL*	**495**	**400.7**	**327.6**	**330.6**	**319.1**
Kebolehdapatan keseluruhan *Overall availlability*	**75.96%**	**76.8%**	**78%**	**73.96%**	**83.81%**

Nota: *Notes:*
[1] Termasuk hidro mini Melangkap, Sayap, Bombalai dan Merotai *Inclusive of Melangkap, Sayap, Bombalai and Merotai mini hydro*

Jadual 31: Penjanaan SESB (GWj)
Table 31: SESB generation (GWh)

SUMBER TENAGA *ENERGY SOURCE*	2013	2014	2015[1]	2016[1]	2017[1]
Hidro *Hydro*	410	292.79	271.92	255.74	309.78
Gas asli *Natural gas*	619	472.44	417.62	389.62	409.93
Diesel	328	557.81	381.35	229.88	186.53
JUMLAH *TOTAL*	**1,357.00**	**1,323.04**	**1,070.89**	**875.24**	**906.23**

Nota: *Notes:*
[1] Termasuk hidro mini Melangkap, Sayap, Bombalai dan Merotai Inclusive of Melangkap, Sayap, Bombalai and Merotai mini hydro

Jadual 32: Bilangan pengguna SESB
Table 32: Number of SESB consumers

SEKTOR *SECTOR*	2013	2014	2015	2016	2017
Domestik *Domestic*	422,964	442,516	460,321	478,049	491,809
Komersil *Commercial*	79,188	82,472	85,581	90,510	93,738
Industri *Industry*	2,937	2,906	2,756	1,545	1,550
Lampu awam *Public lighting*	5,128	5,349	5,596	5,906	6,061
JUMLAH *TOTAL*	**510,217**	**533,243**	**554,254**	**576,010**	**593,158**

Jadual 33: Jualan tenaga elektrik SESB (GWj)
Table 33: SESB electricity sales (GWh)

SEKTOR *SECTOR*	2013	2014	2015	2016	2017
Domestik *Domestic*	1,530	1,583	1,618	1,761	1,721
Komersil *Commercial*	2,018	2,043	2,256	2,352	2,324
Industri *Industry*	1,061	1,086	1,171	1,101	1,056
Lampu awam *Public lighting*	60	63	64	70	72
JUMLAH *TOTAL*	**4,670**	**4,776**	**5,109**	**5,284**	**5,173**

Jadual 34: Sistem penghantaran SESB
Table 34: SESB transmission system

TAHUN *YEAR*	2013	2014	2015	2016	2017
TALIAN & KABEL SISTEM PENGHANTARAN ***TRANSMISSION SYSTEM LINES & CABLES***					
275 kV (cct-km)	492	493	493	598	598
132 kV (cct-km)	1,809	1,829	1,921	2,075.49	2,075
66 kV (cct-km)	119	119	119	119	119
PENCAWANG PENGHANTARAN ***TRANSMISSION SUBSTATIONS***					
Bilangan *Number*	39	36	41	42	44
Kapasiti (MVA) *Capacity (MVA)*	3,657	4,497	4,513	4,995	4,984

Jadual 35: Sistem pengagihan SESB
Table 35: SESB distribution system

TAHUN *YEAR*	2013	2014	2015	2016	2017
TALIAN & KABEL SISTEM PENGAGIHAN[1] ***DISTRIBUTION SYSTEM LINES & CABLES[1]***					
Talian atas (km)[1] *Overhead lines (km)[1]*	8,904	9,038	9,350	9,394	9,026
Kabel bawah tanah (km)[1,2] *Underground cables (km)[1,2]*	1,680.00	1,680.00	2,272.00	2,272.00	791
PENCAWANG PENGAGIHAN ***DISTRIBUTION SUBSTATIONS***					
Bilangan *Number*	6,619	6,781	6,762	7,382	7,382
Kapasiti (MVA) *Capacity (MVA)*	5,864	5,865	4,294	5,969	5,969

Nota: *Notes:*
[1] Sistem 11 kV dan 33kV sahaja *11 kV and 33kV only*
[2] Data Tahun Kewangan SESB *SESB Financial Year Data*

Jadual 36: Kapasiti penjanaan di Sabah pada tahun 2017
Table 36: Generation capacity in Sabah in 2017

Stesen jana kuasa *Power stations*	Sumber tenaga *Energy source*	Kapasiti terpasang (MW) *Installed capacity (MW)*	Kapasiti boleh harap (MW) *Dependable capacity (MW)*
Bersambung dengan Grid Nasional *On grid*			
SESB			
Tenom Pangi	Hidro *Hydro*	75.00	72.55
Patau-patau	Gas asli *Natural gas*	112.00	103.40
Melawa	Diesel	44.00	29.42
Batu Sapi, Sandakan	Diesel	20.00	17.40
Labuk Canopy Genset	Diesel	8.90	8.55
Tawau (Tawau, EC)	Diesel	36.00	21.75
Kubota	Diesel	64.00	64.00
Merotai - Tawau	Hidro mini *Mini hydro*	1.00	0.50
Bombalai - Tawau	Hidro mini *Mini hydro*	1.00	0.50
Sayap	Hidro mini *Mini hydro*	1.00	1.00
Malangkap	Hidro mini *Mini hydro*	0.00	0.00
	JUMLAH *TOTAL*	**362.90**	**319.06**
Penjana bebas *Independent power producers (IPP)*			
Ranhill Powertron Sdn. Bhd.	Gas asli *Natural gas*	208.60	190.00
Sepangar Bay Corporation Sdn.Bhd.	Gas asli *Natural gas*	113.80	100.00
Ranhill Powertron II Sdn. Bhd.	Gas asli *Natural gas*	214.80	190.00
Kimanis Power Sdn. Bhd.	Gas asli *Natural gas*	367.20	285.00
SPR Energy (M) Sdn. Bhd.	Gas asli *Natural gas*	108.20	100.00
Stratavest Sdn. Bhd. (Libaran)	Diesel	64.40	0.00
	JUMLAH *TOTAL*	**1,077.00**	**865.00**
Jumlah bersambung dengan Grid Nasional *Total on grid*		**1,439.90**	**1,184.07**
Tidak bersambung dengan Grid Nasional *Off grid*			
Penjana bebas *Independent power producers (IPP)*			
Serudong Power Sdn. Bhd.	Diesel	37.50	36.00
	JUMLAH *TOTAL*	**37.50**	**36.00**
FEED-IN-TARIFF (FiT)[1]			
FiT- Biogas	Biogas	9.60	9.60
FiT- Biojisim Biomass	Biojisim *Biomass*	48.90	48.90
FiT- Solar PV	Solar	36.93	36.93
FiT- Hidro mini Mini hydro	Hidro mini *Mini Hydro*	6.50	6.50
	JUMLAH *TOTAL*	**101.93**	**101.93**
SESB - HIDRO MINI *MINI HYDRO*			
Naradau, Ranau	Hidro mini *Mini Hydro*	1.76	1.76
Kiau, Kota Belud	Hidro mini *Mini Hydro*	0.35	0.35
Carabau, Ranau	Hidro mini *Mini Hydro*	2.00	2.00
	JUMLAH *TOTAL*	**4.11**	**4.11**
SOLAR BERSKALA BESAR *LARGE SCALE SOLAR (LSS)*			
LSS	Solar	2.00	2.00
	JUMLAH *TOTAL*	**2.00**	**2.00**
COGENERATION			
Cogen Awam *Public Cogen*	Gas asli *Natural gas*	41.80	41.80
	Biojisim *Biomass*	29.20	29.20
	JUMLAH *TOTAL*	**71.00**	**71.00**
Cogen Persendirian *(off-grid) Private Cogen (off-grid)*	Gas asli *Natural gas*	65.00	65.00
	Biojisim *Biomass*	87.00	87.00
	JUMLAH *TOTAL*	**152.00**	**152.00**
PENJANAAN PERSENDIRIAN[2] SELF - *GENERATION*[2]			
Penjanaan persendirian kurang 5 MW *(off grid) Self generation less than 5 MW (off grid)*	Diesel	526.77	526.77
	Biojisim *Biomass*	130.35	130.35
	Solar PV	0.13	0.13
	Biogas	8.81	8.81
	JUMLAH *TOTAL*	**666.06**	**666.06**
Jumlah tidak bersambung dengan Grid Nasional *Total off grid*		**1,034.60**	**1,033.10**
JUMLAH BESAR *GRAND TOTAL*		**2,474.50**	**2,217.16**

Nota: *Notes:* [1] Data diperolehi daripada *Data obtained from* Sustainable Energy Development Authority (SEDA) [2] Data tahun 2015 daripada Pejabat Kawasan ST *2015 Data from ST Regional Offices*

Jadual 37: Campuran penjanaan di Sabah pada tahun 2017 (GWj)
Table 37: Generation mix in Sabah in 2017 (GWh)

Sumber tenaga ***Energy source***	**SESB**	**IPP**	***Feed-in Tariff* (FiT)[1]**	**Cogen (Awam *Public*)**	**Cogen (Persendirian *Private*)**	**Penjanaan persendirian[2] *Self-gen[2]***	**JUMLAH (GWj) *TOTAL* (GWh)**
Gas asli *Natural gas*	409.93	4,897.63					**5,307.56**
MFO/Distillate/ Diesel	186.53	163.97				129.71	**480.21**
Hidro *Hydro*	306.91						**306.91**
Hidro mini *Mini hydro*	15.02[3]		10.88				**25.90**
Biojisim *Biomass*			108.15	25.21	24.58	191.05	**348.99**
Biogas			38.84			4.72	**43.56**
Solar			43.84				**43.84**
Lain-lain (bukan TBB[4]) *Others (non-RE[4])*							**0.00**
JUMLAH *TOTAL*	**918.39**	**5,061.60**	**201.71**	**25.21**	**24.58**	**325.48**	**6,556.97**

Nota: *Notes:*
[1] Data diperolehi daripada *Data obtained from* Sustainable Energy Development Authority (SEDA)
[2] Data tahun 2015 daripada Pejabat Kawasan ST *2015 Data from ST Regional Offices*
[3] Merangkumi hidro mini on grid dan off grid *Inclusive of on-grid and off-grid mini hydro*
[4] TBB: Tenaga boleh diperbaharui *RE: Renewable energy*

Jadual 38: Penjanaan persendirian kurang 5 MW di Sabah
Table 38: Less-than-5 MW self generation in Sabah

Pejabat Kawasan ST ***ST Regional Office***	**Kota Kinabalu (Kawasan Pantai Barat) *(West Coast area)***	**Sandakan (Kawasan Pantai Timur) *(East Coast Area)***	**JUMLAH *TOTAL***
Bilangan lesen sah shg. 31 Dis. 2017 *No. of valid license as of 31 Dec. 2017*	194	830	**1,024**
Kapasiti (MW) *Capacity (MW)*	87.76	578.30	**666.06**
Elektrik dijana (GWj) mengikut sumber tenaga ***Generated electricity by energy source (GWh)***			
Diesel	4.15	80.23	**84.38**
Distillate	-	45.33	**45.33**
Biojisim *Biomass*	3.62	187.43	**191.05**
Tandan sawit kosong *Empty fruit bunches*	3.62	183.23	**186.85**
Habuk kayu *Wood dust*	-	4.20	**4.20**
Biogas	-	4.72	**4.72**
JUMLAH *TOTAL*	***7.77***	**317.71**	**325.48**

Nota: *Notes:*
Data tahun 2015 daripada Pejabat-pejabat Kawasan ST *2015 data from ST Regional Offices*

MAKLUMAT DAN STATISTIK SARAWAK

INFORMATION AND STATISTICS OF SARAWAK

Jadual 39: Maklumat utama prestasi Sarawak Energy Berhad (SEB)
Table 39: Key information on Sarawak Energy Berhad (SEB) performance

PETUNJUK *INDICATOR*	UNIT	2013	2014	2015	2016	2017
Kehendak maksimum *Maximum demand*	MW	1,466	2,036	2,288	3,005	3,489
Jumlah unit penjanaan *Total units generated*	GWj *GWh*	6,572	6,494	7,913	10,144	25,580[1]
Jumlah unit jualan *Total units sold*	GWj *GWh*	10,420	13,440	14,038	20,627	22,556
Hasil jualan elektrik *Sales revenue of electricity*	RM Juta *RM Million*	2,266	2,752	2,911	4,140	4,707
Kapasiti terpasang *Installed capacity*	MW	1,332	1,551	2,241	2,262	4,641[1]
Jumlah kakitangan *Number of employees*	Orang *Person*	4,040	4,174	4,307	4,468	4,713
Hasil jualan elektrik per kakitangan *Sales revenue of electricity per employee*	RM Juta/Kakitangan *RM Million/ Employee*	0.56	0.66	0.68	0.93	0.999
Unit jualan per kakitangan *Units sold per employee*	GWj/Kakitangan *GWh/Employee*	2.58	3.59	3.26	4.62	4.79
Kapasiti terpasang per kakitangan *Installed capacity per employee*	MW/Kakitangan *MW/Employee*	0.33	0.37	0.52	0.51	0.48[2]
Jumlah unit pembelian *Total purchased units*	GWj *GWh*	5,414	8,457	7,721	12,158	-
Jumlah unit eksport *Total exported units*	GWj *GWh*	-	-	-	693	1,119
Jumlah unit import *Total imported units*	GWj *GWh*	-	-	-	-	-

Nota: *Notes:*
[1] Pemilikan Bakun Hydro mulai suku ke-3 2017 *Acquisition of Bakun Hydro in Q3 2017*
[2] Dikira berdasarkan kapasiti terpasang SEB sebanyak 2,241 MW *Calculated based on 2,241 MW installed capacity of SEB*

Jadual 40: Kapasiti terpasang SEB (MW)
Table 40: SEB installed capacity (MW)

SUMBER TENAGA *ENERGY SOURCE*	2013	2014	2015	2016	2017
Hidro *Hydro*	101	337	1,052	1,054	3,452[1]
Gas asli *Natural gas*	588	576	595	615	595
Arang batu *Coal*	480	480	480	480	480
Diesel	163	158	114	114	114
JUMLAH *TOTAL*	**1,332**	**1,551**	**2,241**	**2,262**	**4,641**

Nota: *Notes:*

[1] Pemilikan Bakun Hydro mulai suku ke-3 2017 *Acquisition of Bakun Hydro in Q3 2017*

Jadual 41: Jualan tenaga elektrik SEB (GWj)
Table 41: SEB electricity sales (GWh)

SEKTOR *SECTOR*	2013	2014	2015	2016	2017
Domestik *Domestic*	1,722	1,817	1,940	2,101	2,149
Komersil *Commercial*	2,169	2,291	2,390	2,513	2,562
Industri *Industry*	6,457	9,254	9,619	15,936	17,758
Lampu awam *Public lighting*	72	78	89	77	88
Eksport *Export*	-	-	-	693	1,119
JUMLAH *TOTAL*	**10,420**	**13,440**	**14,038**	**21,320**	**23,675**

Jadual 42: Bilangan pengguna SEB
Table 32: Number of SESB consumers

SEKTOR *SECTOR*	2013	2014	2015	2016	2017
Domestik *Domestic*	483,106	498,601	516,084	536,466	554,467
Komersil *Commercial*	82,160	85,188	88,297	91,359	93,627
Industri *Industry*	985	984	1,004	1,013	1,051
Lampu awam *Public lighting*	7,699	8,152	8,939	9,457	10,040
Eksport *Export*	-	-	-	4	4
JUMLAH *TOTAL*	**573,950**	**592,925**	**614,324**	**638,299**	**659,189**

Jadual 43: Sistem penghantaran SEB
Table 43: SEB transmission system

TAHUN *YEAR*	2013	2014	2015	2016	2017
TALIAN & KABEL SISTEM PENGHANTARAN *TRANSMISSION SYSTEM LINES & CABLES*					
500 kV (cct-km)	-	-	-	-	754
275 kV (cct-km)	1,188	1,235	1,204	1,331	2,761.49
132 kV (cct-km)	398	372	384	388	815.40
66 kV (cct-km)	-	-	-	-	-
PENCAWANG PENGHANTARAN *TRANSMISSION SUBSTATIONS*					
Bilangan *Number*	27	28	28	30	33
Kapasiti (MVA) *Capacity (MVA)*	6,356	6,440	6,359.6	7,239.6	8,809.10

Jadual 44: Sistem pengagihan SEB
Table 44: SEB distribution system

TAHUN *YEAR*	2013	2014	2015	2016	2017
TALIAN & KABEL SISTEM PENGAGIHAN *DISTRIBUTION SYSTEM LINES & CABLES*					
Talian atas (km) *Overhead lines (km)*	22,350	23,210	24,031	24,681	11,997.74
Kabel bawah tanah (km) *Underground cables (km)*	6,969	7,274	7,688	8,122	5,174.89
PENCAWANG PENGAGIHAN *DISTRIBUTION SUBSTATIONS*					
Bilangan *Number*	10,365	10,927	11,435	12,522	13,076
Kapasiti (MVA) *Capacity (MVA)*	4,002	4,174	4,339	8,735	9,061

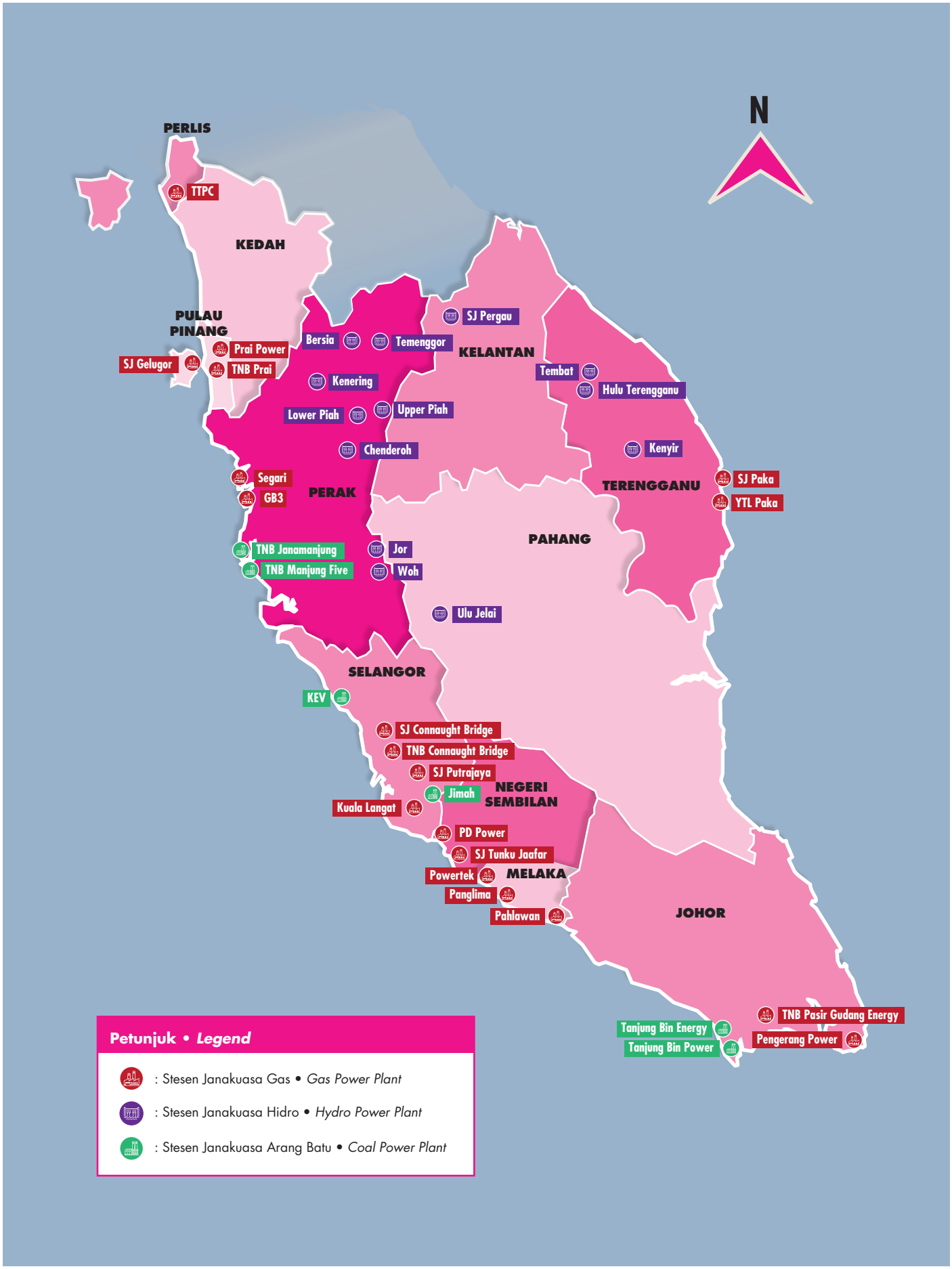
Jadual 45: Kapasiti terpasang dan penjanaan elektrik di Sarawak pada tahun 2017
Table 45: Installed capacity and electricity generation in Sarawak in 2017

Bersambung dengan Grid Nasional *On grid*				
Penjana ***Generator***	**Sumber tenaga** ***Energy source***	**Kapasiti terpasang (MW)** ***Installed capacity (MW)***	**Kapasiti tersedia (MW)** ***Available capacity (MW)***	**Penjanaan (GWj)** ***Generation (GWh)***
SEB	Arang batu *(Coal)*	480.00	378.00	3,173.00
	Diesel	114.00	86.50	169.00
	Gas asli *(Natural gas)*	595.00	566.00	2,918.03
	Hidro *(Hydro)*	3,452.00	3,202.00	19,320.00
	JUMLAH *TOTAL*	**4,641.00**	**4,232.50**	**25,580.03**
Tidak bersambung dengan Grid Nasional *Off grid*				
Penjana ***Generator***	**Sumber tenaga** ***Energy source***	**Kapasiti terpasang (MW)** ***Installed capacity (MW)***	**Kapasiti tersedia (MW)** ***Available capacity (MW)***	**Penjanaan (GWj)** ***Generation (GWh)***
SEB	Solar	0.47	0.47	0.12
	Hidro mini *(Mini hydro)*	7.18	7.18	3.42
	Hidro mikro *(Micro hydro)*	0.32	0.32	
Cogeneration	Gas asli *(Natural gas)*	389.00	389.00	518.55
Penjanaan persendirian *(Self-generation)*	Diesel	12.56	11.54	664.27
	Biojisim *(Biomass)*	49.50	35.65	74.81
	Biogas	0.50	0.00	-
	Lain-lain bukan TBB *(Others non-RE)*	5.05	1.05	15.56
	JUMLAH *TOTAL*	**464.58**	**445.21**	**1,276.73**
	JUMLAH BESAR *GRAND TOTAL*	**5,105.58**	**4,677.71**	**26,856.76**

PETA LOKASI STESEN JANA KUASA DI SEMENANJUNG MALAYSIA, SABAH DAN SARAWAK

LOCATION MAPS OF POWER STATIONS IN PENINSULAR MALAYSIA, SABAH AND SARAWAK

Peta 1: Lokasi stesen-stesen jana kuasa utama di Semenanjung Malaysia
Map 1: Location of major power stations in Peninsular Malaysia

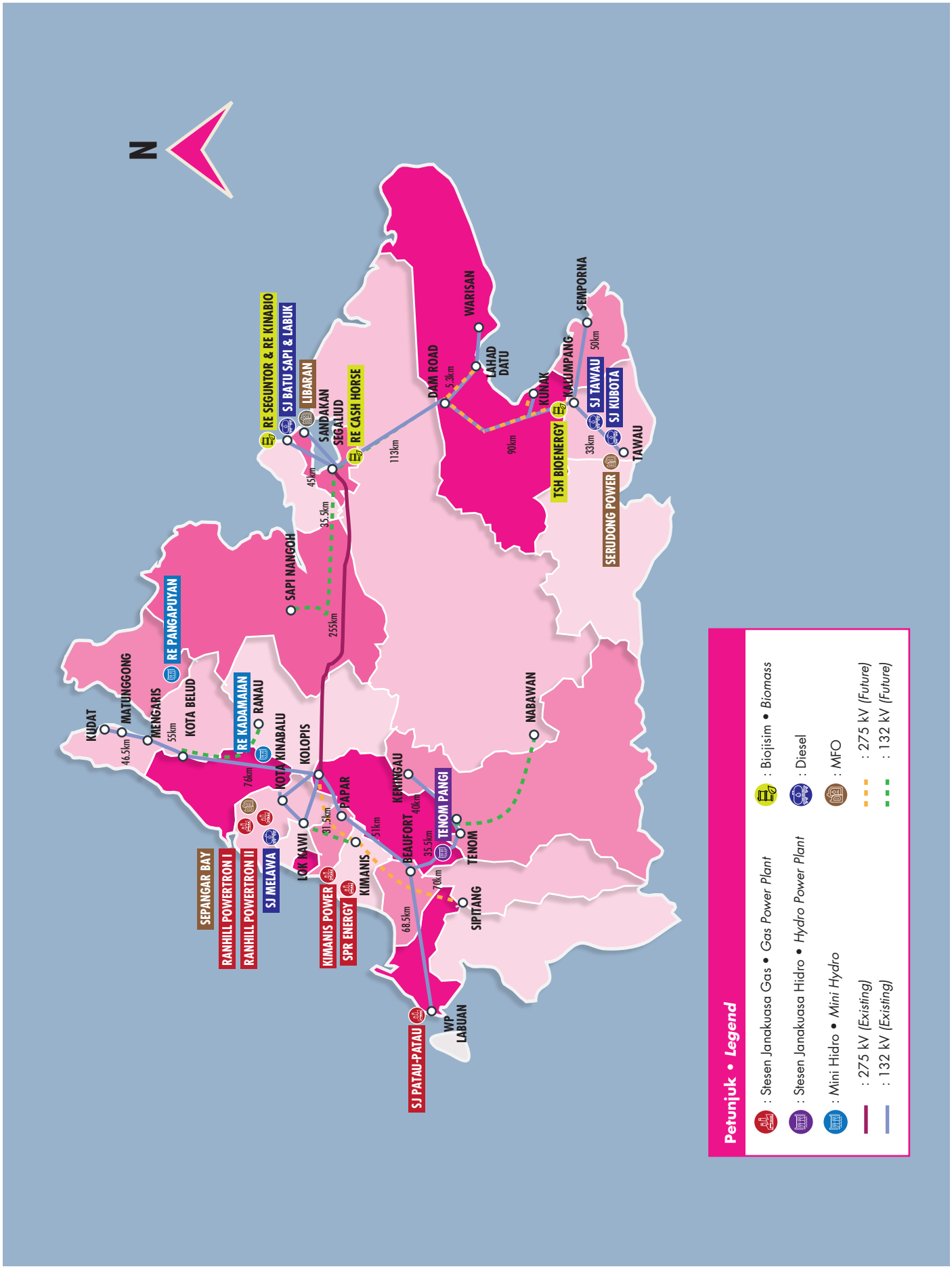


Peta 2: Sistem penghantaran elektrik di Semenanjung Malaysia
Map 2: Electricity transmission system in Peninsular Malaysia

Sumber: *Source:* TNB

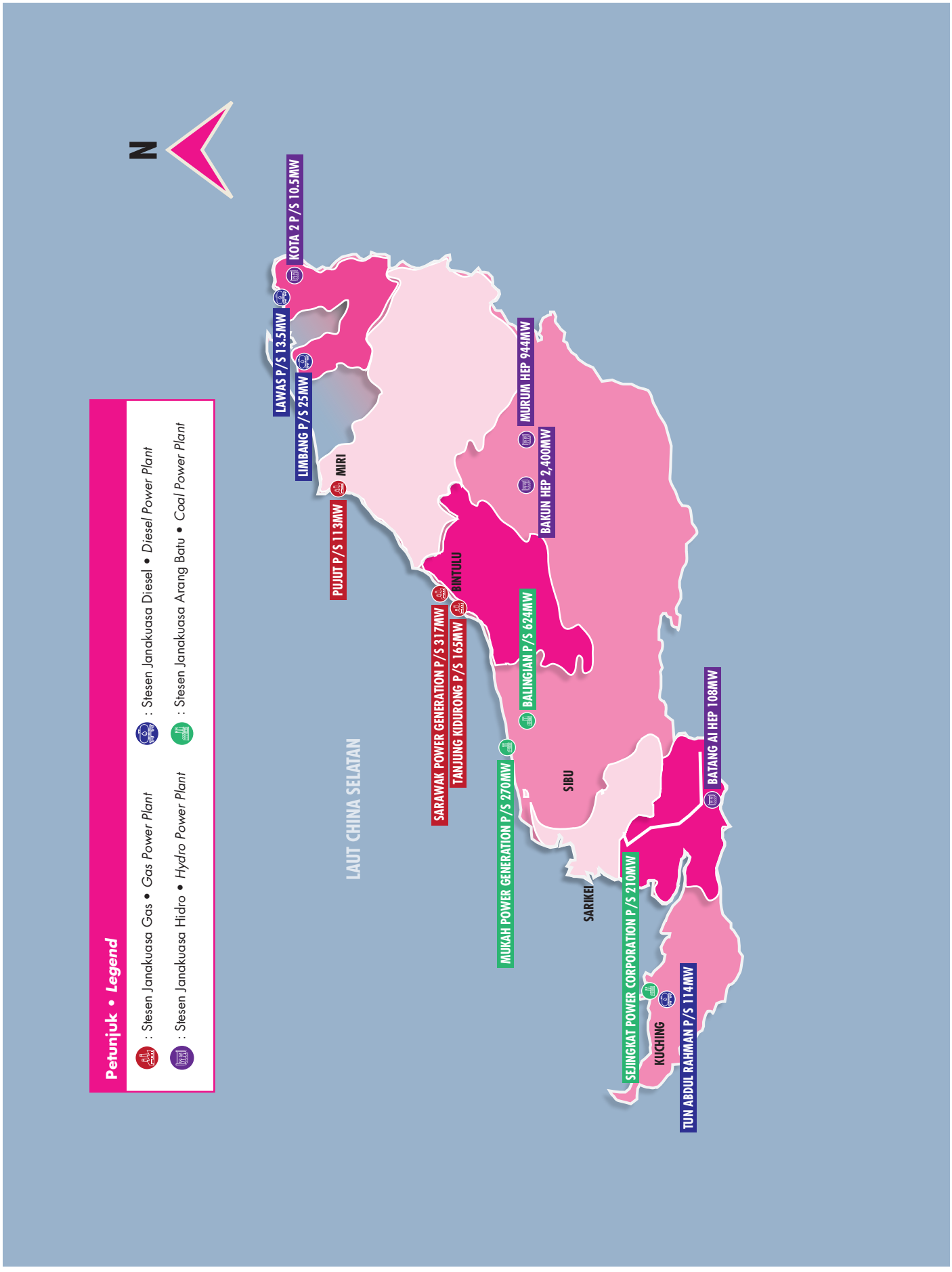
Peta 3: Lokasi stesen jana kuasa utama dan sistem grid di Sabah

Map 3: Location of major power stations and grid system in Sabah



Sumber: *Source:* SESB

Peta 4: Lokasi stesen jana kuasa utama dan sistem grid di Sarawak
Map 4: Location of major power stations and grid system in Sarawak



Sumber: *Source:* SEB

RINGKASAN

SUMMARY

Jadual 46: Kapasiti terpasang mengikut sumber tenaga
Table 46: Installed capacity by energy source

2017	KAPASITI DI MALAYSIA TAHUN 2017 *CAPACITY IN MALAYSIA YEAR 2017*										
					Tenaga boleh diperbaharui (TBB) *Renewable energy (RE)*						
	Arang batu *Coal*	Gas asli *Natural gas*	Diesel/ MFO/ *Distillate*	Hidro *Hydro*	Hidro mini *Mini hydro*	Hidro mikro *Micro hydro*	Biojisim *Biomass*	Biogas	Solar	Lain-lain (bukan TBB) *Others (non-RE)*	**JUMLAH *TOTAL***
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*											
TNB		2,531.00		2,536.10	17.95						5,085.05
IPP	10,066.00	9,225.83			20.00						19,311.83
FiT					23.80		39.00	46.24	317.11		426.15
Cogeneration awam *(Public cogeneration)*		459.63								13.00	472.63
Cogeneration persendirian *(Private cogeneration)*		465.12	79.20				12.41			12.00	568.73
Penjanaan persendirian kurang 5 MW *(Less than 5 MW Self generation)*			399.04		2.13		351.79	4.85	1.00		758.81
Solar Berskala Besar *Large Scale Solar (LSS)*									10.00		10.00
JUMLAH *TOTAL*	**10,066.00**	**12,681.58**	**478.24**	**2,536.10**	**63.88**	**0.00**	**403.20**	**51.09**	**328.11**	**25.00**	**26,633.20**
%	37.8	47.6	1.8	9.5	0.2	0.0	1.5	0.2	1.2	0.1	
SABAH											
SESB		103.40	141.12	72.55	6.11						323.18
IPP		865.00	36.00								901.00
FiT					6.50		48.90	9.60	36.93		101.93
Cogeneration awam *(Public cogeneration)*		41.80					29.20				71.00
Cogeneration persendirian *(Private cogeneration)*		65.00					87.00				152.00
Penjanaan persendirian kurang 5 MW *(Less than 5 MW Self generation)*			526.77				130.35	8.81	0.13		666.06
Solar Berskala Besar *Large Scale Solar (LSS)*									2.00		2.00
JUMLAH *TOTAL*	**0.00**	**1,075.20**	**703.89**	**72.55**	**12.61**	**0.00**	**295.45**	**18.41**	**39.06**	**0.00**	**2,217.17**
%	0.0	48.5	31.7	3.3	0.6	0.0	13.3	0.8	1.8	0.0	

2017	KAPASITI DI MALAYSIA TAHUN 2017 *CAPACITY IN MALAYSIA YEAR 2017*										
	Arang batu *Coal*	Gas asli *Natural gas*	Diesel/ MFO/ *Distillate*	Hidro *Hydro*	Tenaga boleh diperbaharui (TBB) *Renewable energy (RE)*					Lain-lain (bukan TBB) *Others (non-RE)*	**JUMLAH *TOTAL***
					Hidro mini *Mini hydro*	Hidro mikro *Micro hydro*	Biojisim *Biomass*	Biogas	Solar		
SARAWAK											
SEB	378.00	566.00	86.50	3,202.00	7.18	0.32			0.47		4,240.47
Cogeneration		389.00									389.00
Penjanaan persendirian *(self generation)*			11.54				35.65	0.00		1.05	48.24
JUMLAH *TOTAL*	**378.00**	**955.00**	**98.04**	**3,202.00**	**7.18**	**0.32**	**35.65**	**0.00**	**0.47**	**1.05**	**4,677.71**
%	8.1	20.4	2.1	68.5	0.2	0.0	0.8	0.0	0.0	0.0	
JUMLAH BESAR *GRAND TOTAL*	**10,444.00**	**14,711.78**	**1,280.17**	**5,810.65**	**83.67**	**0.32**	**734.30**	**69.50**	**367.64**	**26.05**	**33,528.08**
%	31.2	43.9	3.8	17.3	0.2	0.0	2.2	0.2	1.1	0.1	

Nota: *Notes:*
Semenanjung: Kapasiti terpasang / Sabah: Kapasiti boleh harap / Sarawak: Kapasiti tersedia
Peninsular Malaysia: Installed capacity / Sabah: Dependable capacity / Sarawak: Available capacity

Kapasiti di Malaysia tahun 2017 *Capacity in Malaysia year 2017*	Tersambung dengan Grid Nasional *On Grid*	%	Tidak tersambung dengan Grid Nasional *Off Grid*	%	**JUMLAH BESAR *GRAND TOTAL***
Semenanjung Malaysia *(Peninsular Malaysia)*	24,138.93	90.63	2,494.27	9.37	26,633.20
Sabah	1,184.07	53.40	1,033.10	46.60	2,217.17
Sarawak	4,232.50	90.48	445.21	9.52	4,677.71
JUMLAH *(TOTAL)*	**29,555.50**	**88.20**	**3,972.58**	**11.80**	**33,528.08**

Jadual 47: Penjanaan elektrik mengikut sumber tenaga
Table 47: Electricity generation by energy source

2017	PENJANAAN DI MALAYSIA TAHUN 2017 *GENERATION IN MALAYSIA YEAR 2017*									
					Tenaga boleh diperbaharui (TBB) *Renewable energy (RE)*					
	Arang batu *Coal*	Gas asli *Natural gas*	Diesel/ MFO/ *Distillate*	Hidro *Hydro*	Hidro mini & mikro *Mini & micro hydro*	Biojisim *Biomass*	Biogas	Solar	Lain-lain (bukan TBB) *Others (non-RE)*	**JUMLAH *TOTAL***
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*										
TNB		15,148.54	1.54	7,088.63	42.19					22,280.90
IPP	65,692.95	34,827.32	369.22							100,889.49
FiT					53.71	77.33	103.45	286.19		520.68
Cogen (Awam) *(Public)*		2,895.25								2,895.25
Cogen (Persendirian) *(Private)*		516.03				7.59			71.89	595.51
Penjanaan persendirian *Self-gen*			11.06		5.28	102.62	7.14	0.12	2.04	128.26
JUMLAH *TOTAL*	**65,692.95**	**53,387.14**	**381.82**	**7,088.63**	**101.18**	**187.54**	**110.59**	**286.31**	**73.93**	**127,310.09**
%	51.6	41.9	0.3	5.6	0.1	0.2	0.1	0.2	0.1	
SABAH										
SESB		409.93	186.53	306.91	15.02					918.39
IPP		4,897.63	163.97							5,061.60
FiT					10.88	108.15	38.84	43.84		201.71
Cogen (Awam) *(Public)*						25.21				25.21
Cogen (Persendirian) *(Private)*						24.58				24.58
Penjanaan persendirian *Self-gen*			129.71			191.05	4.72			325.48
JUMLAH *TOTAL*	**0.00**	**5,307.56**	**480.21**	**306.91**	**25.90**	**348.99**	**43.56**	**43.84**		**6,556.97**
%	0.0	81.0	7.3	4.7	0.4	5.3	0.7	0.7	0.0	
SARAWAK										
SEB	3,173.00	2,918.03	169.00	19,320.00	3.42			0.12		25,583.57
Cogen		518.55								518.55
Penjanaan persendirian *Self-gen*			664.27			74.81	-		15.56	754.61
JUMLAH *TOTAL*	**3,173.00**	**3,436.58**	**833.27**	**19,320.00**	**3.42**	**74.81**	**0.00**	**0.12**	**15.56**	**26,856.76**
%	11.8	12.8	3.1	71.9	0.0	0.3	0.0	0.0	0.1	
JUMLAH BESAR *GRAND TOTAL*	**68,865.95**	**62,131.28**	**1,695.30**	**26,715.54**	**130.50**	**611.34**	**154.15**	**330.27**	**89.49**	**160,723.82**
%	42.9	38.7	1.1	16.6	0.1	0.4	0.1	0.2	0.1	

Jadual 48: Jualan tenaga elektrik TNB, SESB dan SEB mengikut sektor pada tahun 2017
Table 48: Electricity sales of TNB, SESB and SEB by sector in 2017

Jualan pada tahun 2017 (GWj) *Sales in 2017 (GWh)*				
Sektor ***Sector***	**TNB**	**SESB**	**SEB**	**Jumlah** ***Total***
Domestik *Domestic*	24,828	1,721	2,149	**28,698**
Komersil *Commercial*	39,086	2,324	2,562	**43,972**
Industri *Industry*	44,457	1,056	17,758	**63,271**
Lampu awam *Public lighting*	1,482	72	88	**1,642**
Perlombongan *Mining*	131	-	-	**131**
Pertanian *Agriculture*	583	-	-	**583**
Eksport *Export*	4.81	-	1,119	**1,124**
Jumlah ***Total***	**110,572**	**5,173**	**23,675**	**139,421**

Jadual 49: Bilangan pengguna TNB, SESB dan SEB mengikut sektor pada tahun 2017
Table 49: Number of TNB, SESB and SEB consumers by sector in 2017

Bilangan pengguna pada tahun 2017 *Number of consumers in 2017*				
Sektor ***Sector***	**TNB**	**SESB**	**SEB**	**Jumlah** ***Total***
Domestik *Domestic*	7,181,846	491,809	554,467	**8,228,122**
Komersil *Commercial*	1,510,341	93,738	93,627	**1,697,706**
Industri *Industry*	28,867	1,550	1,051	**31,468**
Lampu awam *Public lighting*	70,402	6,061	10,040	**86,503**
Perlombongan *Mining*	38	-	-	**38**
Lain-lain termasuk pertanian, eksport & unit percuma *Others including agriculture, export & free units*	4,671	-	4	**4,675**
Jumlah ***Total***	**8,796,165**	**593,158**	**659,189**	**10,048,512**

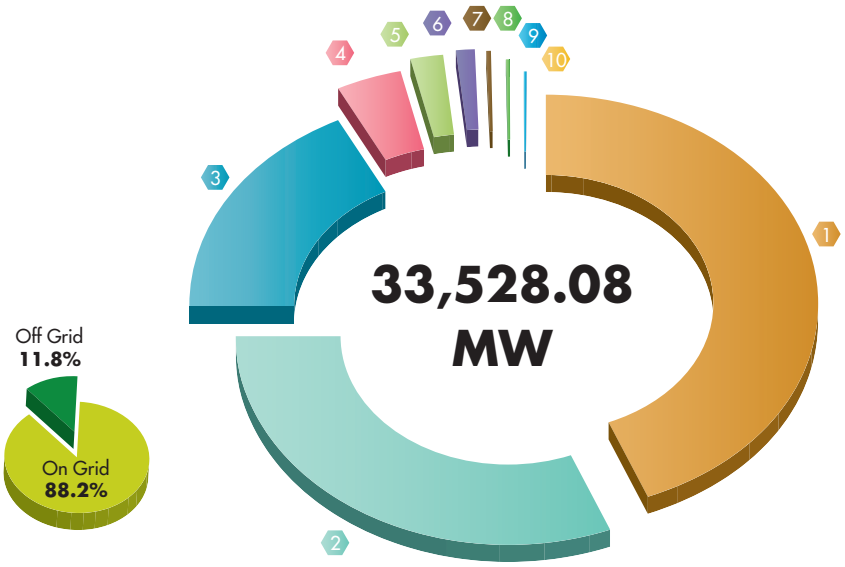
Jadual 50: Penggunaan elektrik mengikut negeri pada tahun 2017
Table 50: Electricity consumption by state in 2017

Negeri ***State***	**Penggunaan elektrik pada tahun 2017 (GWj)** ***Electricity consumption in 2017 (GWh)***
Perlis	750
Kedah	5,235
Penang	11,425
Perak	8,936
Selangor	28,853
Kuala Lumpur	15,186
Negeri Sembilan	5,979
Melaka	4,625
Johor	17,807
Pahang	5,187
Terengganu	2,953
Kelantan	2,375
Putrajaya	1,258
Sabah	5,173
Sarawak	22,556
Jumlah ***Total***	**138,298**

Jadual 51: Penggunaan elektrik mengikut wilayah dan sektor pada tahun 2017
Table 51: Electricity consumption by region and sector in 2017

Penggunaan pada tahun 2017 (GWj) ***Consumption in 2017 (GWh)***				
Sektor ***Sector***	**Semenanjung Malaysia** ***Peninsular Malaysia***	**Sabah**	**Sarawak**	**Jumlah** ***Total***
Domestik *Domestic*	24,828	1,721	2,149	**28,698**
Komersil *Commercial*	39,086	2,324	2,562	**43,972**
Industri *Industry*	44,457	1,056	17,758	**63,271**
Lampu awam *Public lighting*	1,482	72	88	**1,642**
Perlombongan *Mining*	131	-	-	**131**
Pertanian *Agriculture*	583	-	-	**583**
Jumlah ***Total***	**110,567**	**5,173**	**22,556**	**138,298**

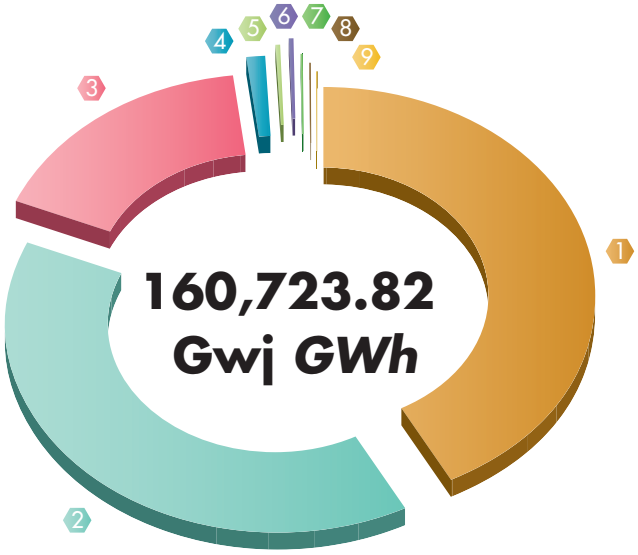
Kapasiti terpasang mengikut sumber tenaga pada tahun 2017
Installed capacity by energy source in 2017



Gas Asli *(Natural Gas)* **43.88%** 1
Arang Batu *(Coal)* **31.15%** 2
Hidro *(Hydro)* **17.33%** 3
Diesel/*Medium Fuel Oil* (MFO)/*Distillate* **3.82%** 4
Biojisim *(Biomass)* **2.19%** 5
Solar **1.10%** 6
Hidro mini *(Mini hydro)* **0.25%** 7
Biogas **0.21%** 8
Lain-lain bukan TBB *(Others non-RE)* **0.08%** 9
Hidro mikro *(Micro hydro)* **0.00%** 10

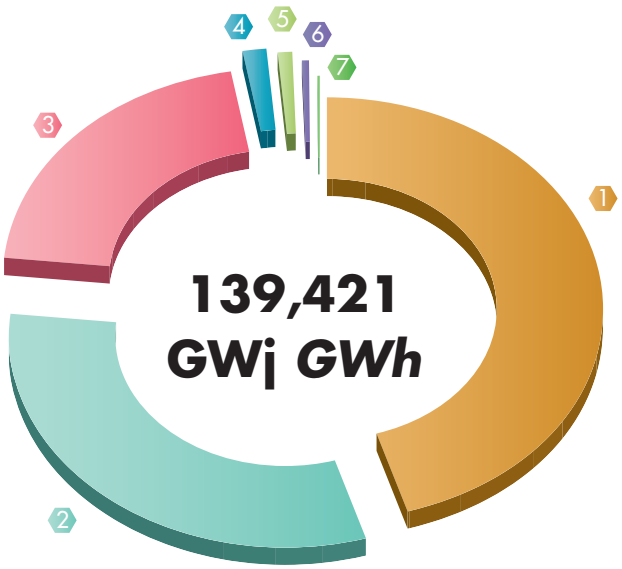
Nota: *Notes:*
Semenanjung: Kapasiti terpasang / Sabah: Kapasiti boleh harap / Sarawak: Kapasiti tersedia
Peninsula: Installed capacity / Sabah: Dependable capacity / Sarawak: Available capacity

Penjanaan elektrik mengikut sumber tenaga pada tahun 2017
Electricity generation by energy source in 2017



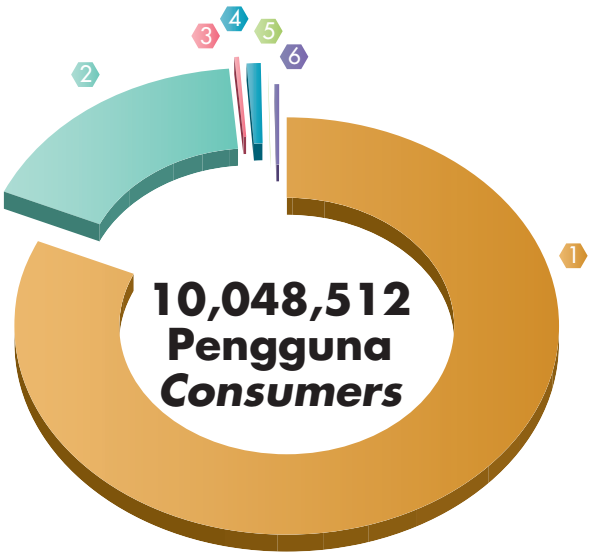
Arang batu *(Coal)* **42.85%** 1
Gas asli *(Natural gas)* **38.66%** 2
Hidro *(Hydro)* **16.62%** 3
MFO/Distillate/Diesel **1.05%** 4
Biojisim *(Biomass)* **0.38%** 5
Solar **0.21%** 6
Biogas **0.10%** 7
Hidro mini & mikro *(Mini & micro hydro)* **0.08%** 8
Lain-lain (bukan TBB) *Others (non-RE)* **0.06%** 9

Jualan elektrik mengikut sektor pada tahun 2017
Electricity sales by sector in 2017



Industri *(Industry)* **45.4%** 1
Komersil *(Commercial)* **31.5%** 2
Domestik *(Domestic)* **20.6%** 3
Lampu awam (Public lighting) **1.2%** 4
Eksport *(Export)* **0.8%** 5
Pertanian *(Agriculture)* **0.4%** 6
Perlombongan *(Mining)* **0.1%** 7

Bilangan pengguna mengikut sektor pada tahun 2017
Number of consumers by sector in 2017



Domestik *(Domestic)* **81.88%** 1
Komersil *(Commercial)* **16.90%** 2
Industri *(Industry)* **0.31%** 3
Lampu awam *(Public lighting)* **0.86%** 4
Perlombongan *(Mining)* **0.0004%** 5
Lain-lain termasuk pertanian, eksport & unit percuma *(Others including agriculture, export & free units)* **0.05%** 6

APENDIKS

APPENDIX

Service Dimension	Service Indicator	Performance level (not more than specified level)	Penalty	Putrajaya/ Cyberjaya	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total
Availability of Supply *- Frequency of Interruption*	*GUARANTEED SERVICE LEVEL: GSL1* *Number of unplanned interruptions experienced by a consumer within the administration of:* *• Bandaraya Kuala Lumpur and Putrajaya* *• Other areas*	*4 per year* *5 per year*	*Domestic consumer* *1% of average monthly bill amount or minimum RM10.00, whichever is higher.* *Commercial consumer* *1% of average monthly bill amount, up to a maximum of RM300.* *Industrial consumer* *0.5% of average monthly bill amount, up to a maximum of RM1000.*														
Total interruptions				24	138	569	527	706	1,710	254	710	337	798	362	1,301	364	**7,800**
Total incidents (not achieving target)				0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total penalty (RM)				0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Percentage performance (%)				100	100	100	100	100	100	100	100	100	100	100	100	100	**100**
Availability of Supply *- Restoration time*	*GUARANTEED SERVICE LEVEL: GSL2* *Time taken to restore electricity supply following outage caused by minor distribution network fault*. Time taken to restore electricity supply following major incident on distribution supply network**, except due to natural disaster or weather -related incident, for:* *• Medium voltage breakdown (33, 22 and 11kV) cable system with feedback* *• Medium voltage_*	*3 hours* *4 hours*	*Domestic consumer* *1% of monthly bill amount or minimum RM10.00, whichever is higher.* *Commercial consumer* *1% of monthly bill amount, up to a maximum of RM300.* *Industrial consumer* *0.5% of monthly bill amount, up to a maximum of RM1000*														

Service Dimension	Service Indicator	Performance level (not more than specified level)	Penalty	Putrajaya/ Cyberjaya	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total
	breakdown without alternative feedback (cable, overhead and substation) Time taken to restore electricity supply following major incident on grid or transmission system except due to natural disaster, and causing: • Partial Blackout • Total blackout	12 hours 8 hours 18 hours	(Monthly bill of the particular month when non-compliance occurs) **For major incidents involving the grid or transmission system, the decision to impose penalty is dependent on the outcome of investigation by the Commission**														
Total interruptions				24	138	569	527	706	1,710	254	710	337	798	362	1,301	364	**7,800**
Total incidents (not achieving target)				0	0	25	47	56	264	0	46	13	26	26	356	57	**916**
Total penalty (RM)				0	0	201,480	127,170	211,530	1,940,010	0	162,630	35,560	246,180	16,120	874,270	108,930	**3,923,880**
Percentage performance (%)				100.00	100.00	95.61	91.08	92.07	84.56	100.00	93.52	96.14	96.74	92.82	72.64	84.34	**88.26**
Providing Supply	**GUARANTEED SERVICE LEVEL : GSL3** Time taken to implement connection requiring low voltage cable installation work from registration for new individual connection (NC) until connection of electricity supply and after premise to be supplied is ready to receive cable, and also subject to clearance of wayleave from relevant party (ies)	5 working days (over-head line)	RM50 Applies only to the last 3 additional poles nearest to the premises														
Total service connection				1	893	5,725	1,985	5,662	65,476	2,173	3,750	6,443	1,787	1,456	6,591	7,559	**49,501**
Total service connection not completed in 7 working days				0	186	349	108	525	877	23	307	48	177	104	656	1,143	**4,503**
Total penalty (RM)				0	9,300	17,450	5,400	26,250	43,850	1,150	15,350	2,400	8,850	5,200	32,800	57,150	**225,150**
		14 working days (underground cable)	RM50 Applies only to the last 3 additional poles nearest to the premises														

Service Dimension	Service Indicator	Performance level (not more than specified level)	Penalty	Putrajaya/ Cyberjaya	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total
Total service connection				39	46	144	79	194	820	108	162	153	711	162	535	236	**3,389**
Total service connection not completed in 14 working days				4	1	4	6	9	44	2	4	2	18	4	18	12	**128**
Total penalty (RM)				200	50	200	300	150	2,200	100	200	100	900	200	900	600	**6,400**
Percentage performance (%)				90.00	80.09	93.99	94.48	90.88	85.37	98.90	92.05	99.24	92.19	93.33	90.54	85.18	**91.24**
Providing Supply	GUARANTEED SERVICE LEVEL : GSL4 Time taken to connect new electricity supply for individual domestic low voltage consumer after deposit is paid (date of connection is to be mutually agreed upon between consumer and TNB and there is access) For meter installation only. Counting of the number of days will start a day after receiving the deposit.	3 working days	RM50														
Total supply connection				4,890	5,206	8,951	15,416	9,761	41,531	8,402	10,180	4,287	19,987	9,167	34,687	3,828	**176,293**
Total supply connections not completed in 3 working days				106	53	133	56	60	1,123	58	84	23	77	76	145	89	**2,083**
Total penalty (RM)				5,300	2,650	6,650	2,800	3,000	56,150	2,900	4,200	1,150	3,850	380	7,250	4,450	**104,150**
Percentage performance (%)				97.83	98.98	98.51	99.64	99.39	97.30	99.31	99.17	99.46	99.61	99.17	99.58	97.68	**98.82**
Providing Supply	GUARANTEED SERVICE LEVEL : GSL5 Disconnection of supply according to the applicable legislation or disconnection procedures.	No wrongful disconnection	RM100														
Total disconnection				0	643	6,442	2,144	1,632	32,890	2,021	2,803	2,944	19,418	1,846	11,350	778	**84,911**
Total disconnection not done with procedures				0	0	0	1	1	6	0	0	0	5	0	2	0	**15**
Total penalty (RM)				0	0	0	100	100	600	0	0	0	500	0	200	0	**1,500**
Percentage performance (%)				0	100	100	100	100	100	100	100	100	100	100	100	100	**100**
Total penalty in RM per state (GSL1,2,3,4,5)				**5,500**	**120,000**	**225,780**	**135,770**	**241,330**	**2,042,810**	**4,150**	**183,380**	**39,210**	**260,280**	**25,320**	**915,420**	**171,120**	**4,261,080**
Total penalty in RM Nationwide (GSL1,2,3,4,5)				**4,261,080**													

Apendiks 2: Laporan prestasi Tenaga Nasional Berhad (TNB) – Minimum Service Level (MSL)
Appendix 2: Performance report of Tenaga Nasional Berhad (TNB) - Minimum Service Level (MSL)

Service Dimension	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/ Avg %
Availability of Supply	1a. Minimum duration of notice for planned/scheduled interruption of electricity supply.	2 days														
	Total notices served		124	8	820	1,069	1,628	4,223	164	1,503	6,013	2,014	948	2,985	216	**14,515**
	Total notices served less than 2 days before planned/ scheduled interruption		124	8	806	992	1,551	4,004	164	1,443	598	208	933	2,785	190	**13,806**
	% Compliance		100	100	98.29	92.80	95.27	94.81	100%	96.01	97.55	97.20	98.42	93.30	87.96	**95.12**
	1b. Upon request, time taken to provide initial information to Consumer who report on electricity interruption	1 hour														
	Total requests from consumers		458	458	458	458	458	458	458	458	458	458	458	458	458	**458**
	Total requests replied less than 1 hour		436	436	436	436	436	436	436	436	436	436	436	436	436	**436**
	% Compliance		95.20	95.20	95.20	95.20	95.20	95.20	95.20	95.20	95.20	95.20	95.20	95.20	95.20	**95.20**
Quality of Supply	2a. Time taken to rectify voltage complaint or limit violation and to correct voltage complaint which requires network reinforcement.	180 days														
	Total complaints received		0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	Total complaints solved less than 180 days		0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	% Compliance		None	None	None	None	None	None	None	None	None	None	None	None	None	**None**
	2b. Time taken to complete investigation of over voltage from complaint receipt date.	30 working days														
	Total complaints received		0	0	13	75	22	185	25	5	6	0	13	55	69	**469**
	Total complaints solved less than 30 working days		0	0	0	57	6	68	20	2	0	0	3	43	12	**211**
	% Compliance		None	None	0	76	27	37	77	40	0	None	2308	78.18	17.39	**44.99**
	2c. Time taken to provide a complete report of voltage sag from complaints received date.	14 days														
	Total complaints received		1	0	6	232	49	69	54	12	9	64	10	84	2	**592**
	Total complaints solved less than 14 days		1	0	1	141	27	29	44	9	6	41	4	33	1	**337**
	% Compliance		100	None	16.67	60.78	55.10	42.03	81.48	75	66.67	64.06	40	39.29	50	**56.93**
Providing Supply	3a. Time taken to inform the developer of the connection charges to be paid upon receipt of complete application. i) For supply up to 22kV ii) For supply of 33kV	 30 days 60 days														
	No. of contribution charge letters issued		39	29	141	151	204	646	110	170	87	202	128	569	77	**2553**
	No. of contribution charge letters issued less than 60 days		39	28	92	127	171	543	110	138	75	188	125	482	74	**2192**
	% Compliance		100	96.55	65.25	84.11	83.82	84.06	100	81.18	86.21	93.07	97.66	84.71	96.10	**85.86**

Service Dimension	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/ Avg %
	3b. Time taken to implement electrification scheme requiring new substations after connection charges paid, way leave obtained and successful taking over of substation building by TNB:															
	i) For supply up to 22kV	60 days														
	ii) For supply of 33kV with cable installation not more than 5km.															
	a) For KL, Putrajaya area	180 days														
	b) For other areas	120 days														
	Total no. of projects given supply		12	20	64	124	54	350	71	66	18	173	78	297	24	**1351**
	Total no. of projects given supply less than 120 days		11	16	50	116	34	310	61	63	16	166	60	266	22	**1191**
	% Compliance		91.67	80	78.13	93.55	62.96	88.57	85.92	95.45	88.89	95.95	76.92	89.56	91.67	**88.16**
	3c. Waiting time at site for appointment to connect electricity supply. (Unavoidable occurrence must be followed up by returning call in not less than 1 hour before the appointment time).	1 hour														
	Total appointments made		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
	Total appointments met in not less than 1 hour of appointment date		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
	% Compliance		None	None	None	None	None	None	None	None	None	None	None	None	None	**None**
Customer Contact	4a. Time taken to reply to written enquiry or complaint.	7 working days														
	Total written enquiries/complaints received		4	0	2	5	11	80	3	11	1	44	10	14	6	**191**
	Total enquiries/complaints replied less than 7 working days		4	0	2	5	11	80	3	11	1	44	10	14	6	**191**
	% Compliance		100	0	100	100	100	100	100	100	100	100	100	100	100	**100**
	4b. Queuing time at customer service counter.	15 minutes														
	Total customers served		4,582	12,298	185,502	77,332	268,645	225,894	93,462	245,515	153,291	124,741	144,674	287,194	235,408	**2,058,538**
	Total customers served less than 15 minutes		4,068	11,612	175,687	72,247	249,884	198,318	89,196	232,513	149,098	114,709	143,366	256,182	227,192	**1,924,072**
	% Compliance		88.78	94.42	94.71	93.42	93.02	87.79	95.44	94.70	97.26	91.96	99.10	89.20	96.51	**93.47**
	4c. Time taken by customer service officer at CMC 15454 to pick up ringing telephone	90% calls answered within 30 seconds														
	90% calls answered within 30 seconds		2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	2,380,373	**2,380,373**
	Total incoming calls answered less than 30 seconds		2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	2,14,2831	**2,14,2831**
	% Compliance		90.02	90.02	90.02	90.02	90.02	90.02	90.02	90.02	90.02	90.02	90.02	90.02	90.02	**90.02**

Service Dimension	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/ Avg %
Metering Services	5a. Time taken to attend to meter problem upon official notification/ request by the consumer (appointment, visit, testing, etc.).	2 working days														
	No. of appointments, visit, testing completed		3	N/A	25	27	16	163	9	3	30	125	17	54	5	**477**
	No. of appointments, visit, testing completed less than 2 working days		2	N/A	19	19	8	118	7	3	20	80	12	35	5	**328**
	% Compliance		66.67	None	76	7037	50	72.39	77.78	100	66.67	64	70.59	64.81	100	**68.76**
	5b. Time taken to respond to metering problem or dispute upon official notification / request by consumer (replace, relocate, etc.).	3 working days														
	No. of meteer replacement/relocation completed		N/A	N/A	N/A	3	8	25	1	2	26	67	6	31	1	**170**
	No. of meteer replacement/relocation completed less than 3 working days		N/A	N/A	N/A	3	8	24	1	2	26	65	6	31	1	**167**
	% Compliance		None	None	None	100	100	96	100	100	100	97.01	100	100	100	**98.24**
	5c. Time interval between successive rendering of bill(s)	1 month														
	Total no. of customers (OPC)		516,358	N/A	7,907,855	7,825,725	10,688,984	22,192,353	3,989,721	5,981,457	4,259,204	14,144,945	5,270,809	15,740,044	5,539,541	**104,056,996**
	Total no. of billed customers		501,729	N/A	7,840,537	7,743,258	10,607,845	21,762,510	3,941,278	5,926,172	4,227,205	13,807,416	5,204,081	15,566,702	5474436	**102,603,169**
	% Compliance		97.17	None	99.15	98.95	99.24	98.06	98.79	99.08	99.25	97.61	98.73	98.90	98.82	**98.60**
Average 9-months % Compliance			**92.95**	**79.46**	**73.95**	**87.93**	**79.33**	**82.14**	**91.79**	**88.89**	**82.31**	**89.64**	**82.48**	**85.26**	**85.31**	**84.61**
Average 12-months % Compliance										**84.61**						

		Q1 & Q2																	
Item	Criteria	Jan	Feb	Mar	Jan	Feb	Mar	Total in Q1	No. meeting target in Q1	% meeting target in Q1	Apr	May	Jun	Apr	May	Jun	Total in Q2	No. meeting target in Q2	% meeting target in Q2
1	CONNECTION OF SUPPLY - AFTER SUBMITTED COMPLETE ESA																		
	Details Applied for 1a & 1b - EC clarified that this performance target only came into effect when the customer had satisfied all condition (contribution, form G&H, etc) and the stated interval had elapsed. EC would not agree to the standard being less than 1 day																		
1a	Change of tenant																		
	Agreed targets																		
	Not more than 1 working day	6	3	5	6	3	5	14	14	100	3	5	6	3	5	6	14	14	100
1b	New Connection - Low Voltage Individual Application																		
	Agreed targets																		
	Not more than 1 working day	19	16	19	19	16	19	54	54	100	8	8	10	8	8	10	26	26	100
1c (i)	New connection -Low Voltage Bulk application and housing schemes. Refers to a large number of houses or building in a single development. EC do not agree to reduce the target.																		
	Agreed targets																		
	Not more than 1 week (Meter only)	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
1c (ii)	LV commercial industrial supply (Meter only - CT Type) *EC agree that NUR to proposed item (ii) - (vi)																		
	Agreed targets																		
	Connection within 2 weeks	0	0	0	0	0	0	0	0	NA	1	0	0	1	0	0	1	1	100
1c (iii)	LV supply - LV cable and meter																		
	Agreed targets																		
	Within 2 months from receipt and payment of contribution charge and security deposit.	0	0	1	0	0	1	1	1	100	3	2	0	3	2	0	5	5	100
1c (iv)	LV supply requiring new substation																		
	Agreed targets																		
	Within 120 days from receipt and payment of contribution charge and security deposit within 45 days of substation building handover	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
1c (v)	11kV or 33kV supply																		
	Agreed targets																		
	Within 8 to 10 months of submission and contribution payment or sooner as agreed. Within 45 days of substation building handover.	0	0	1	0	0	1	1	1	100	0	0	0	0	0	0	0	0	NA
1c (vi)	132kV supply																		
	Agreed targets																		

Q1 & Q2																			
Item	Criteria	Jan	Feb	Mar	Jan	Feb	Mar	Total in Q1	No. meeting target in Q1	% meeting target in Q1	Apr	May	Jun	Apr	May	Jun	Total in Q2	No. meeting target in Q2	% meeting target in Q2
	Within 18 months of submission and customer contribution							0	0	NA							0	0	NA
2	RESTORATION OF SUPPLY AFTER INTERRUPTION																		
	Agreed targets																		
	EC clarified that calls should be answered within 30 seconds and to follow up with return call is required only if NUR could not inform consumers that action was been taken.																		
2a	Complaint through telephone at normal hours will be attended within 30 seconds. Re contacted consumer within 10 minutes if cannot produce info immediately. Note : In NUR's case, the response is always by stating a technician will be sent immediatel																		
	Agreed targets																		
	30 seconds to answer the telephone. A technician will be sent immediately, when this is not possible, the customer will be called back with information.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
2b	Consumer who launch a supply interruption report will be given a report number. TCS - Trouble Call System is required to implement this accordingly.																		
	Agreed targets																		
	Consumer will be given a number. No. of customers is small and No. of interruption is very small and easily managed. To assume as complying.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
2c	Time to restore *Minor fault which results in interruption of Electricity supply that can be quickly restored *Minor - such as due to the operation of fuse or the tripping of a circuit breaker resulting from overload																		
	Agreed targets																		
	Within 90 minutes	3	2	3	3	2	3	8	8	100	4	2	1	4	2	1	7	7	100
2d	Time to restore *Major fault which results in interruption of Electricity supply that requires substantial time to restore *Major such as due to switchgear failure or cable fault																		
	Agreed targets																		
	Within 12 hours	0	3	0	0	3	0	3	3	100	1	0	1	1	0	1	2	2	100
3	SUPPLY RE CONNECTION AFTER DISCONNECTION FOR NON-PAYMENT																		
	Details																		
	Consumer paying bills will be re connect at the same day.																		
	Agreed targets																		
	Payment before 14:00 hour the re connect will be done on the same day.	0	0	0	0	0	0	0	0	NA	253	0	0	253	0	0	253	253	100
4	SUPPLY INTERRUPTIONS, WHICH WERE PLANNED / SCHEDULE.																		
4a	Interruption scheduled for Domestic / small commercial																		
	Agreed targets																		
	Consumer will be given a notice 7 days before scheduled	4	3	2	4	3	2	9	9	100	4	3	2	4	3	2	9	9	100
4b	Interruption scheduled for Major consumers																		
	Agreed targets																		

Q1 & Q2																			
Item	Criteria	Jan	Feb	Mar	Jan	Feb	Mar	Total in Q1	No. meeting target in Q1	% meeting target in Q1	Apr	May	Jun	Apr	May	Jun	Total in Q2	No. meeting target in Q2	% meeting target in Q2
	Discussion with individual consumer on their manufacturing plans and the shut down scheduled to meet their requirements. In exceptional cases, where essential work is planned at least one months notice will be given.	0	0	0	0	0	0	0	0	NA	1	0	0	1	0	0	1	1	100
5	METER READING																		
	Details																		
	Estimated reading for domestic consumers must not exceed 3 consecutive months and the estimated reading must also be base on the prorated / average consumable of the 3 previuos months. A notice will be given to the domestic consumers for reminder of the estimated reading is exceeding 3 consecutive months.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
6	ENQUIRIES FROM CONSUMERS																		
	Details																		
	Respond time for query through:																		
	Agreed targets																		
	i) Written - 5 days from receipt of written complaint ii) Telephone - 30 seconds and 24 hours. iii) Cash counter - 30 seconds and 24 hours. It was agreed that the telephone response times can be reviewed by NUR, due to difficulty in measuring performance.	6	4	9	6	4	9	19	19	100.00	6	6	5	6	6	5	17	17	100.00
7	SERVICE COUNTER																		
	Agreed targets																		
	Waiting time should not exceed 10 minutes	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA

		Q1 & Q2																	
Item	Criteria	Jan	Feb	Mar	Jan	Feb	Mar	Total in Q1	No. meeting target in Q1	% meeting target in Q1	Apr	May	Jun	Apr	May	Jun	Total in Q2	No. meeting target in Q2	% meeting target in Q2
8	APPOINTMENT FOR METER ACCURACY DETERMINATION																		
	Details																		
	Days to test meter following request																		
	Agreed targets																		
	2 working days	1	1	2	1	1	2	4	4	100.00	0	2	0	0	2	0	2	2	100.00
9	METER REPLACEMENT																		
	Details																		
	Following request and found necessary (Day to replace meter)																		
9a	Simple domestic consumers																		
	Agreed targets																		
	2 working days	2	1	0	2	1	0	3	3	100.00	0	2	0	0	2	0	2	2	100.00
9b	LV commercial / 11kV / 33kV / 132kV																		
	Agreed targets																		
	5 working days for confirmation of defect, subject to agreement on shut down of supply.	2	0	0	2	0	0	2	2	100.00	0	3	0	0	3	0	3	3	100.00
10	APPOINTMENT WITH CONSUMERS																		
	Agreed targets																		
	Arrived on time for all appointment. A follow up appointment will be scheduled immediately within 1 working day from the earlier date and notifying consumer as soon as posible if appointment is cancelled.	4	3	2	4	3	2	9	9	100	4	3	2	4	3	2	9	9	100
11	SECURITY DEPOSITS																		
	Details																		
	EC accepted NUR explanation that minimum deposit is required for small supplies. EC proposal is acceptable for cash deposit. BG's will be reduced when they come up for renewal																		
	Agreed targets																		
	Deposit will be returned to consumers after 6 months if it were found the prorated average consumption is exceeded 2 months, subject to not being less than the minimum amount.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
11a	Interest on Deposit																		
	Agreed targets																		

Q1 & Q2																			
Item	Criteria	Jan	Feb	Mar	Jan	Feb	Mar	Total in Q1	No. meeting target in Q1	% meeting target in Q1	Apr	May	Jun	Apr	May	Jun	Total in Q2	No. meeting target in Q2	% meeting target in Q2
	2.5% to be rebated at the end of the year.	4922	0	0	4922	0	0	4922	4922	100.	0	0	0	0	0	0	0	0	NA
12	REFUND OF CONSUMER DEPOSITS																		
	Agreed targets																		
	Within 1 month	0	28	24	0	28	24	52	52	100	2	10	11	2	10	11	23	23	100
13	COLLECTION																		
	Details																		
	Proof of payment received :NUR would request longer date line due to allow any cheque payment to be cleared by the bank to comply with bank procedure																		
	Agreed targets																		
	5 working days	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
14	DISCONNECTION OF SUPPLY (SAFETY, THEFT ETC)																		
14a	Disconnection due to installation which were very dangerous and disconnection could not be delayed																		
	Agreed targets																		
	No notice will given (immediate disconnection)	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
14b	In any unsafe particular situation and likely source of danger to consumers, disconnection will be an immediate. Other situation will advise consumers that disconnection would be carried out in the specific time.																		
	Agreed targets																		
	Immediate disconnection	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
14c	Disconnections due to other reasons than 14a & 14b above, which was allowed to. Time, which are NOT allow to proceed with disconnection work: i) Before week end or Public Holidays. ii) Week end or Public Holidays. iii) After 12 noon on working days.																		
	Agreed targets																		
	7 working days notice	0	0	0	0	0	0	0	0	NA	253	0	0	253	0	0	253	253	100.00
15	SPECIAL CONSUMERS WHO FACE PROBLEMS IN PAYING BILLS																		
	Details																		
	This criterion applies to disabled or elderly consumers. A register of disable or immobile consumers will be needed																		
	Agreed targets																		
	NUR will make special arrangement or collect from consumers premises.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
16	VOLTAGE OUTSIDE STANDARD																		
	Where no capital work on network is required																		
	Agreed targets																		
	1 day	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
16b	Where supply interruption is required but no network enhancement work needed																		
	Agreed targets																		
	8 days (Notify interruption 7 days)	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
16c	Where network enhancement work is required																		
	Agreed targets																		
	3 months	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA

Q1 & Q2																			
Item	Criteria	Jan	Feb	Mar	Jan	Feb	Mar	Total in Q1	No. meeting target in Q1	% meeting target in Q1	Apr	May	Jun	Apr	May	Jun	Total in Q2	No. meeting target in Q2	% meeting target in Q2
17	NEW / INCREASE OF SUPPLY APPLICATION REPLY																		
	Details																		
	Written reply of application including date supply will be available and connection charges will be forwarded to consumers																		
17a	No substation required																		
	Agreed targets																		
	1 week	0	0	0	0	0	0	0	0	NA	0	2	2	0	2	2	4	4	100
17b	New upgrade substation required - This to allow time for design work and obtaining of prices from contractors.																		
	Agreed targets																		
	1 month	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0
17c	LV commercial / 11kV / 33kV - This to allow time for design work and obtaining of prices from contractors.																		
	Agreed targets																		
	1 month	0	0	0	0	0	0	0	0	NA	1	0	0	1	0	0	1	1	100
17d	132kV																		
	Agreed targets																		
	Within 3 months	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA
18	TRANSFERRING OF METER LOCATION UPON CONSUMER REQUEST / METER TRANSFER																		
	Details																		
	Depending on the new location and work required																		
	Agreed targets																		
	3 working days	3	1	1	3	1	1	5	5	100.	1	0	0	1	0	0	1	1	100.00
19	EDUCATION OF ENERGY EFFICIENCY																		
	Agreed targets																		
	Will be available at NUR Customer Service Centre at Kulim Hi-Tech Park. Seminars will also be conducted through Consumer Committees in line with the license.	0	0	1	0	0	1	1	1	100.00	0	0	1	0	0	1	1	1	100.00
20	POWER QUALITY IMPROVEMENT																		
20a	Domestic consumers																		
	Agreed targets																		
	NUR shall advise and guide consumers in the quality of supply and all power quality related issues.	0	0	0	0	1	0	0	0	NA	0	0	0	0	0	0	0	0	NA
20b	LV commercial / 11kV / 33kV / 132kV																		
	Agreed targets																		
	Power Quality meeting with all major customers on Quarterly basis.	15	1	0	15	1	0	16	16	100.00	6	5	2	6	5	2	13	13	100.00

		Q3 & Q4																				
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
1	CONNECTION OF SUPPLY - AFTER SUBMITTED COMPLETE ESA																					
1a	Change of tenant																					
	Agreed targets																					
	Details																					
	Applied for 1a & 1b - EC clarified that this performance target only came into effect when the customer had satisfied all condition (contribution, form G&H, etc) and the stated interval had elapsed. EC would not agree to the standard being less than 1 day																					
	Not more than 1 working day	1	4	5	1	4	5	10	10	100	6	2	3	6	2	3	11	11	100	49	49	100
1b	New Connection ow Voltage Individual Application																					
	Agreed targets																					
	Not more than 1 working day	8	7	2	8	7	2	17	17	100	10	8	5	10	8	5	23	23	100	120	120	100
1c (i)	New connection - Low Voltage Bulk application and housing schemes. Refers to a large number of houses or building in a single development. EC do not agree to reduce the target.																					
	Agreed targets																					
	Not more than 1 week (Meter only)	0	0	2	0	2	2	2	2	100	0	0	0	0	0	0	0	0	NA	2	2	100
1c (ii)	LV commercial industrial supply (Meter only - CT Type) *EC agree that NUR to proposed item (ii) - (vi)																					
	Agreed targets																					
	Connection within 2 weeks	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	1	1	100
1c (iii)	LV supply - LV cable and meter																					
	Agreed targets																					
	Within 2 months from receipt and payment of contribution charge and security deposit.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	6	6	100
1c (iv)	LV supply requiring new substation																					
	Agreed target																					
	Within 120 days from receipt and payment of contribution charge and security deposit within 45 days of substation building handover	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
1c (v)	11kV or 33kV supply																					
	Agreed targets																					
	Within 8 to 10 months of submission and contribution payment or sooner as agreed. Within 45 days of substation building handover.	0	0	1	0	0	1	1	1	100	0	0	0	0	0	0	0	0	NA	2	2	100

		Q3 & Q4																					
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
1c (vi)	132kV supply																					
	Agreed targets																					
	Within 18 months of submission and customer contribution							0	0	NA							0	0	NA	0	0	NA
2	RESTORATION OF SUPPLY AFTER INTERRUPTION																					
	Agreed targets																					
	EC clarified that calls should be answered within 30 seconds and to follow up with return call is required only if NUR could not inform consumers that action was been taken.																					
2a	Complaint through telephone at normal hours will be attended within 30 seconds. Re contacted consumer within 10 minutes if cannot produce info immediately. Note : In NUR's case, the response is always by stating a technician will be sent immediatel																					
	Agreed targets																					
	30 seconds to answer the telephone. A technician will be sent immediately, when this is not possible, the customer will be called back with information.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0		0	0	NA
2b	Consumer who launch a supply interruption report will be given a report number. TCS - Trouble Call System is required to implement this accordingly.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	6	6	100
	Agreed target																					
	Consumer will be given a number. No. of customers is small and No. of interruption is very small and easily managed. To assume as complying.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	NA
2c	Time to restore *Minor fault which results in interruption of Electricity supply that can be quickly restored										*Minor - such as due to the operation of fuse or the tripping of a circuit breaker resulting from overload											
	Agreed targets																					
	Within 90 minutes	1	4	1	1	4	1	6	6	100	1	1	0	1	1	0	2	2	100	23	23	100
2d	Time to restore *Major fault which results in interruption of Electricity supply that requires substantial time to restore										*Major such as due to switchgear failure or cable fault											
	Agreed targets																					
	Within 12 hours	5	2	1	5	2	1	8	8	100	3	2	3	2	2	3	8	7	87.50	21	20	95.24
	SUPPLY RE CONNECTION AFTER DISCONNECTION FOR NON-PAYMENT																					
	Details																					
	Consumer paying bills will be re connect at the same day.																					
	Agreed targets																					

		Q3 & Q4																				
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
	Payment before 14:00 hour the re connect will be done on the same day.	0	378	0	0	378	0	378	378	100	0	0	0	0	0	0	0	0	NA	631	631	100
4	SUPPLY INTERRUPTIONS, WHICH WERE PLANNED / SCHEDULE.																					
	Interruption scheduled for Domestic / small commercial																					
1a	Agreed targets																					
	Consumer will be given a notice 7 days before scheduled	1	5	2	1	5	2	8	8	100	3	1	2	3	1	2	6	6	100	32	32	100
4b	Interruption scheduled for Major consumers																					
	Agreed targets																					
	Discussion with individual consumer on their manufacturing plans and the shut down scheduled to meet their requirements. In exceptional cases, where essential work is planned at least one months notice will be given.	1	4	2	1	4	2	7	7	100	1	4	1	1	4	1	6	6	100	28	28	100
	METER READING																					
5	Details																					
	Estimated reading for domestic consumers must not exceed 3 consecutive months and the estimated reading must also be base on the prorated / average consumable of the 3 previuos months. A notice will be given to the domestic consumers for reminder of the estimated reading is exceeding 3 consecutive months.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
6	ENQUIRIES FROM CONSUMERS																					
	Details																					
	Respond time for query through:																					
	Agreed targets																					

		Q3 & Q4																				
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
	i) Written - 5 days from receipt of written complaint ii) Telephone - 30 seconds and 24 hours. iii) Cash counter - 30 seconds and 24 hours. It was agreed that the telephone response times can be reviewed by NUR, due to difficulty in measuring performance.	12	8	9	12	8	9	29	29	100.00	11	3	11	11	3	11	25	25	100	90	90	100
7	SERVICE COUNTER																					
	Agreed targets																					
	Waiting time should not exceed 10 minutes	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
8	APPOINTMENT FOR METER ACCURACY DETERMINATION																					
	Details																					
	Days to test meter following request																					
	Agreed targets																					
	2 working days	1	1	1	1	1	1	3	3	100.00	0	1	2	0	1	2	3	3	100	12	12	100
9	METER REPLACEMENT																					
	Details																					
	Following request and found necessary (Day to replace meter)																					
9a	Simple domestic consumers																					
	Agreed targets																					
	2 working days	0	2	2	0	2	2	4	4	100.00	1	1	2	1	1	2	4	4	100	13	13	100
9b	LV commercial / 11kV / 33kV / 132kV																					
	Agreed targets																					
	5 working days for confirmation of defect, subject to agreement on shut down of supply.	1	0	0	1	0	0	1	1	100.00	0	0	0	0	0	0	0	0	NA	6	6	100
	Arrived on time for all appointment. A follow up appointment will be scheduled immediately within 1 working day from the earlier date and notifying consumer as soon as posible if appointment is cancelled.	3	7	3	3	7	3	13	13	100.00	2	4	0	2	4	0	6	6	100	48	48	100
10	APPOINTMENT WITH CONSUMERS																					
	Agreed targets																					

		Q3 & Q4																				
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
	Deposit will be returned to consumers after 6 months if it were found the prorated average consumption is exceeded 2 months, subject to not being less than the minimum amount.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
11a	Interest on Deposit0																					
	Agreed targets																					
	2.5% to be rebated at the end of the year.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	4,922	4,922	100
12	REFUND OF CONSUMER DEPOSITS																					
	Agreed targets																					
	Within 1 month	4	10	12	4	10	12	26	26	100.	7	8	0	7	8	0	15	15	100	116	116	100
13	COLLECTION																					
	Details																					
	Proof of payment received :NUR would request longer date line due to allow any cheque payment to be cleared by the bank to comply with bank procedure																					
	Agreed targets																					
	5 working days	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
14	DISCONNECTION OF SUPPLY (SAFETY, THEFT ETC																					
14a	Disconnection due to installation which were very dangerous and disconnection could not be delayed																					
	Agreed targets																					
	No notice will given (immediate disconnection)	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
14b	In any unsafe particular situation and likely source of danger to consumers, disconnection will be an immediate. Other situation will advise consumers that disconnection would be carried out in the specific time.																					
	Agreed targets																					
	Immediate disconnection	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
14c	Disconnections due to other reasons than 14a & 14b above, which was allowed to. Time, which are NOT allow to proceed with disconnection work: i) Before week end or Public Holidays. ii) Week end or Public Holidays. iii) After 12 noon on working days.																					
	Agreed targets																					
	7 working days notice	0	378	0	0	378	0	378	378	100.00	0	0	0	0	0	0	0	0	NA	631	631	100
15	SPECIAL CONSUMERS WHO FACE PROBLEMS IN PAYING BILLS																					
	Details																					
	This criterion applies to disabled or elderly consumers. A register of disable or immobile consumers will be needed																					
	Agreed targets																					
	NUR will make special arrangement or collect from consumers premises.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA

		Q3 & Q4																				
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
16	VOLTAGE OUTSIDE STANDARD																					
16a	Where no capital work on network is required																					
	Agreed targets																					
	1 day	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
16b	Where supply interruption is required but no network enhancement work needed																					
	Agreed targets																					
	8 days (Notify interruption 7 days)	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
16c	Where network enhancement work is required																					
	Agreed targets																					
	3 months	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
17	NEW / INCREASE OF SUPPLY APPLICATION REPLY																					
	Written reply of application including date supply will be available and connection charges will be forwarded to consumers																					
17a	No substation required																					
	Agreed targets																					
	1 week	0	3	1	0	3	1	4	4	100	3	0	0	3	0	0	3	3	100.00	11	11	100
17b	New upgrade substation required - This to allow time for design work and obtaining of prices from contractors.																					
	Agreed targets																					
	1 month	0	1	0	0	1	1	1	100	0	0	0	0	0	0	0	0	NA	NA	1	1	100
17c	LV commercial / 11kV / 33kV - This to allow time for design work and obtaining of prices from contractors.																					
	Agreed targets																					
	1 month	0	1	0	0	1	0	1	1	100	0	1	0	1	0	0	1	1	100.00	3	3	100
17d	132kV																					
	Agreed targets																					
	Within 3 months	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA			
18	TRANSFERRING OF METER LOCATION UPON CONSUMER REQUEST / METER TRANSFER																					
	Details																					
	Depending on the new location and work required																					
	Agreed targets																					
	3 working days	2	4	1	2	4	1	7	7	100.	4	0	1	4	0	1	5	5	100.00	18	18	100
19	EDUCATION OF ENERGY EFFICIENCY																					
	Agreed targets																					
	Will be available at NUR Customer Service Centre at Kulim Hi-Tech Park. Seminars will also be conducted through Consumer Committees in line with the license.	1	0	0	1	0	0	1	1	100.00	0	0	1	0	0	1	1	1	100.00	4	4	100
20	POWER QUALITY IMPROVEMENT																					

		Q3 & Q4																				
Item	Criteria	Jul	Aug	Sep	Jul	Aug	Sep	Total in Q3	No. meeting target in Q3	% meeting target in Q3	Oct	Nov	Dec	Oct	Nov	Dec	Total in Q4	No. meeting target in Q4	% meeting target in Q4	Total in 2017	No. meeting target in 2017	% meeting target in 2017
20a	Domestic consumers																					
	Agreed targets																					
	NUR shall advise and guide consumers in the quality of supply and all power quality related issues.	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	NA	0	0	NA
20b	LV commercial / 11kV / 33kV / 132kV																					
	Agreed targets																					
	Power Quality meeting with all major customers on Quarterly basis.	3	7	3	3	7	3	13	13	100.00	2	4	0	2	4	0	6	6	100.00	48	48	100
																				6,838	6,837	99.985

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
1	**PENYAMBUNGAN BEKALAN ELEKTRIK** Selepas kontrak ditandatangan	***ELECTRICITY SUPPLY CONNECTION*** *After contract signed*				
1.1	**PENUKARAN PENGGUNA**	***CHANGE OF TENANCY***				
1.1.1	Bilangan Permohonan	*Number of application*	8,550	12,804	11,486	9,653
1.1.2	Bilangan permohonan yang disambung dalam tempoh tidak lebih daripada 1 hari bekerja dari tarikh temujanji pengujian pemasangan	*Number of application connected within not more than 1 working day from the date of installation test appointment*	8,550	12,797	11,485	9,653
1.1.3	Peratus permohonan yang disambung dalam tempoh tidak lebih daripada 1 hari bekerja dari tarikh temujanji pengujian pemasangan	*Percentage of application connected within not more than 1 working day from the date of installation test appointment*	100.00%	99.95%	99.99%	100.00%
1.2	**BEKALAN BARU VOLTAN RENDAH (PERMOHONAN INDIVIDU)**	***NEW LOW VOLTAGE SERVICE CONNECTION (INDIVIDUAL APPLICATION)***				
1.2.1	Bilangan Permohonan	*Number of application*	24,221	22,071	20,321	22,236
1.2.2	Bilangan permohonan yang disambung dalam tempoh tidak lebih daripada 2 hari bekerja dari tarikh temujanji pengujian pemasangan	*Number of application connected within not more than 2 working days from the date of installation test appointment*	23,060	21,469	20,093	21,848
1.2.3	Peratus permohonan yang disambung dalam tempoh tidak lebih daripada 2 hari bekerja dari tarikh temujanji pengujian pemasangan	*Percentage of application connected within not more than 2 working days from the date of installation test appointment*	97.27%	95.21%	98.88%	98.26%
1.3	**BEKALAN BARU VOLTAN RENDAH (PERMOHONAN PUKAL DAN SKIM PERUMAHAN)**	***NEW LOW VOLTAGE SERVICE CONNECTION (BULK AND HOUSING SCHEMES APPLICATION)***				
1.3.1	Bilangan Permohonan	*Number of application*	8,083	7,070	9,881	5,293
1.3.2	Bilangan permohonan yang disambung dalam tempoh tidak lebih daripada 2 minggu bekerja dari tarikh temujanji pengujian pemasangan	*Number of application connected within not more than 2 weeks from the date of installation test appointment*	7,806	6,629	9,473	5,292
1.3.3	Peratus permohonan yang disambung dalam tempoh tidak lebih daripada 2 minggu bekerja dari tarikh temujanji pengujian pemasangan	*Percentage of application connected within not more than 2 weeks from the date of installation test appointment*	96.57%	93.76%	95.87%	99.98%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
2	**PEMULIHAN SEMULA BEKALAN SELEPAS GANGGUAN**	***RESTORATION OF ELECTRICITY SUPPLY AFTER INTERRUPTION***				
2.1	Bilangan pengguna yang melapor kepada SESB	*Number of consumer reporting to SESB*	305,794	334,008	318,960	280,090
2.2	Bilangan pengguna yang mana maklumat tidak dapat diberikan pada masa itu dihubungi semula dalam tempoh 15 minit	*Number of consumer which information cannot be given at the time who has been recalled within 15 minutes*	302,740	330,664	315,769	277,290
2.3	Bilangan pengguna yang diberi nombor aduan	*Number of consumer who given a complaint reference number*	305,794	334,008	318,960	280,090
2.4	Bilangan kerosakan kecil	*Number of minor outage*	28,116	33,152	39,175	38,783
2.5	Bilangan kerosakan kecil yang dipulihkan dalam tempoh 2 jam	*Number of minor outage restored within 2 hours*	25,097	30,403	36,990	37,823
2.6	Bilangan kerosakan besar	*Number of major outage*	5,245	5,063	4,127	4,334
2.7	Bilangan kerosakan besar yang dipulihkan dalam tempoh 12 jam	*Number of major outage restored within 12 hours*	4,692	4,979	4,040	4,292
2.8	Peratus bilangan pengguna yang mana maklumat tidak dapat diberikan pada masa itu dihubungi semula dalam tempoh 15 minit	*Percentage of consumer which information cannot be given at the time who has been recalled within 15 minutes*	99.00%	99.00%	99.00%	99.00%
2.9	Peratus bilangan pengguna yang diberi nombor aduan	*Percentage of consumer who given a complaint reference number*	100.00%	100.00%	100.00%	100.00%
2.10	Peratus kerosakan kecil yang dipulihkan dalam tempoh 2 jam	*Percentage of minor outage restored within 2 hours*	89.26%	91.71%	94.42%	97.52%
2.11	Peratus kerosakan besar yang dipulihkan dalam tempoh 12 jam	*Percentage of major outage restored within 12 hours*	89.46%	98.34%	97.89%	99.03%
3	**PENYAMBUNGAN BEKALAN YANG DIPOTONG**	***RECONNECTION OF SUPPLY AFTER BEING DISCONNECTED***				
3.1	Bilangan pemotongan bekalan	*Number of supply disconnected*	174,346	175,252	214,435	287,742
3.2	Bilangan pengguna yang mana bekalannya dipotong menjelaskan semua bayaran sebelum 1.00 tengahari pada hari yang sama	*Number of consumer whose supply being disconnected and settled all bills before 1:00 p.m. on the same day*	121,270	118,783	136,856	179,731

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
3.3	Bilangan pengguna yang mana telah menjelaskan semua bayaran sebelum pukul 1.00 tengahari mendapat bekalan semula pada hari yang sama	*Number of consumer whose settled all bills before 1:00 p.m. and reconnected on the same day*	113,455	116,527	136,406	179,613
3.4	Peratus pengguna yang mana telah menjelaskan semua bayaran sebelum pukul 1.00 tengahari mendapat bekalan semula pada hari yang sama	*Percentage of consumer whose settled all bills before 1:00 p.m. and reconnected on the same day*	93.56%	98.10%	99.67%	99.93%
4	**GANGGUAN BEKALAN YANG DIRANCANG/ BERJADUAL**	***PLANNED/SCHEDULE INTERRUPTION OF ELECTRICITY SUPPLY***				
4.1	**GANGGUAN BERJADUAL**	***SCHEDULED INTERRUPTIONS***				
4.1.1	Bilangan gangguan berjadual	*Number of scheduled interruptions*	972	745	988	2,437
4.1.2	Bilangan pengguna terlibat	*Number of consumer affected*	263,709	203,035	268,554	221,613
4.1.3	Bilangan pengguna terlibat yang diberikan notis atau cara-cara yang sesuai sekurang-kurangnya 7 hari sebelum gangguan	*Number of consumer affected who has been notified by notice or in an appropriate ways at least 7 days before interruptions*	257,322	202,828	268,554	221,613
4.1.4	Peratus pengguna terlibat yang diberikan notis atau cara-cara yang sesuai sekurang-kurangnya 7 hari sebelum gangguan	*Percentage of consumer affected who has been notified by notice or in an appropriate ways at least 7 days before interruptions*	97.58%	99.90%	100.00%	100.00%
4.2	**RANCANGAN GANGGUAN BERJADUAL**	***PLANNED SCHEDULED INTERRUPTIONS***				
4.2.1	Bilangan rancangan gangguan berjadual tahunan/ bulanan	*Number of annually/monthly planned scheduled interruptions*	654	442	656	544
4.2.2	Bilangan pengguna besar yang dijangka terlibat	*Number of large power consumer affected*	28,337	4,314	64,305	13,121
4.2.3	Bilangan pengguna besar yang dijangka terlibat yang dimaklumkan mengenai rancangan gangguan berjadual tahunan/bulanan	*Number of large power consumer affected who has been notified about the annually/monthly planned scheduled interruptions*	28,337	4,314	64,305	13,121
4.2.4	Peratus bilangan pengguna besar yang dijangka terlibat yang dimaklumkan mengenai rancangan gangguan berjadual tersebut	*Percentage of large power consumer affected who has been notified about the annually/monthly planned scheduled interruptions*	100.00%	100.00%	100.00%	100.00%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
5	**BACAAN METER**	***METER READING***				
5.1	Bilangan pengguna domestik yang mana bacaan meter dibuat secara anggaran melebihi 3 bulan berturut-turut	*Number of domestic consumer who estimated meter reading has been carried out for more than 3 months consecutively*	64,819	66,556	50,195	55,439
5.2	Bilangan pengguna domestik yang mana bacaan meter dibuat secara anggaran melebihi 3 bulan berturut-turut diberi notis	*Number of domestic consumer who estimated meter reading has been carried out for more than 3 months consecutively being given a notice*	64,819	66,082	50,195	55,439
5.3	Peratus pengguna domestik yang mana bacaan meter dibuat secara anggaran melebihi 3 bulan berturut-turut diberi notis	*Percentage of domestic consumer who estimated meter reading has been carried out for more than 3 months consecutively being given a notice*	100.00%	99.29%	100.00%	100.00%
6	**PERTANYAAN DARIPADA PENGGUNA**	***ENQUIRY FROM CONSUMER***				
6.1	**PERTANYAAN BERTULIS**	***WRITTEN ENQUIRY***				
6.1.1	Bilangan pertanyaan bertulis yang diterima daripada pelanggan	*Number of written enquiry received from the consumer*	7,306	1,179	2,083	1,145
6.1.2	Bilangan pertanyaan bertulis yang diterima daripada pelanggan yang dijawab dalam tempoh 5 hari bekerja dari tarikh penerimaan	*Number of written enquiry received from the consumer which replied within 5 working days from the date of receipt within 5 working days from the date of receipt*	7,274	1,149	2,083	1,145
6.1.3	Peratus bilangan pertanyaan bertulis yang diterima daripada pelanggan yang dijawab dalam tempoh 5 hari bekerja dari tarikh penerimaan	*ercentage of written enquiry received from the consumer which replied within 5 working days from the date of receipt*	99.56%	97.46%	100.00%	100.00%
6.2	**PER TANYAAN MELALUI TELEFON**	***ENQUIRY VIA TELEPHONE***				
6.2.1	Bilangan pertanyaan melalui telefon yang diterima daripada pelanggan	*Number of enquiry via telephone received from the consumer*	66,255	60,428	86,157	85,711
6.2.2	Bilangan pelanggan yang mana pertanyaannya tidak dapat diselesaikan pada masa itu juga dihubungi semula dalam masa 24 jam	*Number of consumer whose enquiry cannot be resolved at that time has been recalled within 24 hours*	64,319	60,140	85,698	85,046
6.2.3	Peratus bilangan pelanggan yang mana pertanyaannya tidak dapat diselesaikan pada masa itu juga dihubungi semula dalam masa 24 jam	*Percentage of consumer whose enquiry cannot be resolved at that time has been recalled within 24 hours*	97.08%	99.52%	99.47%	99.22%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
6.3	**PERTANYAAN DI KAUNTER**	***ENQUIRY AT THE COUNTER***				
6.3.1	Bilangan pengguna yang membuat pertanyaan di kaunter	*Number of consumer who made enquiry at the counter*	206,489	225,738	261,473	312,044
6.3.2	Bilangan pengguna yang mana pertanyaannya tidak dapat diselesaikan pada masa itu juga dihubungi semula dalam tempoh 24 jam	*Number of consumer whose enquiry cannot be resolved at that time can be recalled within 24 hours*	203,299	224,836	260,889	310,240
6.3.3	Bilangan pengguna yang mana pertanyaannya tidak dapat diselesaikan pada masa itu tidak juga dapat dihubungi semula dalam tempoh 24 jam	*Number of consumer whose enquiry cannot be resolved at that time cannot be recalled within 24 hours*	8,409	14,767	42,543	76,160
6.3.4	Peratus bilangan pengguna yang mana pertanyaannya tidak dapat diselesaikan pada masa tu juga dihubungi semula dalam tempoh 24 jam	*Percentage of consumer whose enquiry cannot be resolved at that time has been recalled within 24 hours*	98.46%	99.60%	99.78%	99.42%
7	**PERKHIDMATAN KAUNTER**	***COUNTER SERVICE***				
7.1	Bilangan pengguna yang mendapatkan sebarang perkhidmatan di kaunter	*Number of consumer who made transactions at the counter service*	676,443	800,070	982,748	964,456
7.2	Bilangan pengguna yang mana masa menunggu tidak melebihi 15 minit	*Number of consumer who waiting time not more than 15 minutes*	595,524	720,793	953,153	958,714
7.3	Peratus bilangan pengguna yang mana masa menunggu tidak melebihi 15 minit	*Percentage of consumer who waiting time not more than 15 minutes*	88.04%	90.09%	96.99%	99.40%
8	**TEMUJANJI UNTUK PENGUJIAN METER**	***APPOINTMENT FOR METER ACCURACY TEST***				
8.1	Bilangan temujanji untuk ujian kejituan meter	*Number of appointment for meter accuracy test*	1,096	1,632	1,769	1,326
8.2	Bilangan pengujian meter yang dibuat dalam tempoh 2 hari bekerja	*Number of meter test carried out within 2 working days*	1,005	1,589	1,742	1,312
8.3	Peratus bilangan pengujian meter yang dibuat dalam tempoh 2 hari bekerja	*Percentage of meter test carried out within 2 working days*	91.70%	97.37%	98.47%	98.94%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
9	**PENUKARAN METER**	***METER REPLACEMENT***				
9.1	Bilangan permohonan yang didapati perlu membuat penukaran meter	*Number of application that need for meter replacement*	13,643	6,459	4,622	7, 518
9.2	Bilangan penukaran yang dibuat dalam tempoh 2 hari bekerja dari tarikh permohonan dibuat	*Number of replacement carried out within 2 working days from the date of application*	13,525	6,362	4,212	7, 134
9.3	Peratus bilangan penukaran meter yang dibuat dalam tempoh 2 hari bekerja dari tarikh permohonan dibuat	*Percentage of replacement carried out within 2 working days from the date of application*	99.14%	98.50%	91.13%	94. 89%
10	**TEMUJANJI DENGAN PENGGUNA**	***APPOINTMENT WITH CONSUMER***				
10.1	Bilangan temujanji dengan pengguna yang dibuat di luar SESB	*Number of appointment with consumer outside SESB premise*	10,302	2,474	3,237	2, 523
10.2	Bilangan temujanji dengan pengguna yang mana pihak SESB sampai tidak lewat dari masa yang dijanjikan	*Number of appointment with consumer which SESB arrived no later than the promised time*	1,300	2,474	3,216	2, 519
10.3	Peratus bilangan temujanji dengan pengguna yang mana pihak SESB sampai tidak lewat dari masa yang dijanjikan	*Percentage of appointment with consumer which the SESB arrived no later than the promised time*	99.85%	100.00%	99.35%	99. 84%
10.4	Bilangan temujanji yang perlu ditangguhkan	*Number of appointment has to be postponed*	60	127	182	81
10.5	Bilangan temujanji susulan yang mana dibuat dalam tempoh 1 hari bekerja dari tarikh tangguhan dibuat	*Number of follow-up appointment made within 1 working day from the postponed date*	60	123	180	81
10.6	Peratus bilangan temujanji susulan yang mana dibuat dalam tempoh 1 hari bekerja dari tarikh tangguhan dibuat	*Percentage of follow-up appointment made within 1 working day from the postponed date*	100.00%	96.85%	98.90%	100.00%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
11	**CAGARAN**	***DEPOSIT***				
11.1	Bilangan pengguna yang mana selepas 6 bulan didapati cagaran melebihi 2 bulan purata penggunaan	*Number of consumer whose deposit held were more than 2 months average consumption after 6 months*	673	6,314	1,869	9 ,339
11.2	Bilangan pengguna yang mana dipulangkan lebihan cagarannya	*Number of consumer who refunded the excess deposit*	625	5,590	1,869	463
11.3	Peratus bilangan pengguna yang mana dipulangkan lebihan cagarannya	*Percentage of consumer who refunded the excess deposit*	92.87%	88.53%	100.00%	4.69%
12	**PEMULANGAN WANG CAGARAN PENGGUNA**	***REFUND OF CONSUMER'S DEPOSIT***				
12.1	Bilangan pengguna yang telah memajukan segala dokumen yang diperlukan bagi tujuan pemulangan wang cagaran	*Number of consumer who submitted all necessaries document for deposit refund puposes*	7,314	8,537	8,192	7, 723
12.2	Bilangan pengguna yang mana wang cagarannya telah dipulangkan dalam tempoh 1 bulan selepas penyerahan segala dokumen yang diperlukan	*Number of consumer who deposit has been refunded within 1 month after submission of all necessaries document*	7,015	8,128	7,866	7, 625
12.3	Peratus bilangan pengguna yang mana wang cagarannya telah dipulangkan dalam tempoh 1 bulan selepas penyerahan segala dokumen yang diperlukan	*Percentage of consumer who deposit has been refunded within 1 month after submission of all necessaries document*	95.91%	95.21%	96.02%	98. 73%
13	**PUNGUTAN**	***COLLECTION***				
13.1	Bilangan pengguna yang membayar melalui pos	*Number of consumer paid via mail*	161,058	132,729	49,678	153, 671
13.2	Bilangan pengguna yang diberi pengesahan pembayaran dalam tempoh 2 hari selepas pembayaran dibuat	*Number of consumer who given payment confirmation within 2 days after the payment made*	161,058	132,729	46,428	153, 671

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
13.3	Peratus bilangan pengguna yang diberi pengesahan pembayaran dalam tempoh 2 hari selepas pembayaran dibuat	*Percentage of consumer who given payment confirmation within 2 days after the payment made*	100.00%	100.00%	93.46%	100.00%
14	**PEMOTONGAN BEKALAN**	***DISCONNECTION OF ELECTRICITY SUPPLY***				
14.1	Dengan notis 24 jam	*With 24 hours notice*				
14.1.1	Bilangan pemotongan akibat pepasangan membahayakan	*Number of disconnection due to dangerous installation*	337	283	171	20
14.1.2	Bilangan pemotongan akibat disyaki berlaku kecurian elektrik	*Number of disconnection due to suspected theft of electrical*	146	376	218	47
14.1.3	Bilangan pemotongan akibat meter elektrik dirosakkan	*Number of disconnection due to electricity meter damaged*	3	8	6	1
14.2						
14.2.1	Bilangan pemotongan akibat kegagalan membayar bil selepas 30 hari dari tarikh bil dan 7 hari bekerja notis pemotongan	*Number of disconnection due to non payment of bills after 30 days from the billing date and 7 days of notice*	81, 647	94, 772	106, 957	140, 563
14.2.2	Bilangan pemotongan akibat kegagalan membayar cagaran tambahan selepas 7 hari tuntutan dibuat	*Number of disconnection due to non payment of additional deposit after 7 days claims made*	8, 629	4, 969	165	1, 395
14.2.3	Bilangan pemotongan tanpa notis akibat pepasangan yang amat membahayakan dan tidak boleh dilengahkan	*Number of disconnection without notice due to dangerous installation and cannot be delayed*	7, 714	1, 620	44	35
15	**PENGGUNA KHAS YANG MENGHADAPI MASALAH MEMBAYAR BIL ELEKTRIK**	***SPECIAL NEEDS CONSUMER ENCOUNTERING PROBLEM TO PAY BILL***				
15.1	Bilangan pengguna cacat yang merayu mengelakkan pemotongan	*Number of disability consumer who appeal for not to disconnect the supply*	0	3	7	0

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
15.2	Bilangan pengguna lanjut usia yang merayu mengelakkan pemotongan	*Number of elderly consumer who appeal for not to disconnect the supply*	14	70	39	5
15.3	Bilangan pengguna cacat yang dibantu dalam urusan pembayaran bil	*Number of disability consumer who assisted in the payment of bills*	6	33	37	118
15.4	Bilangan pengguna lanjut usia yang dibantu dalam urusan pembayaran bil	*Number of elderly consumer who assisted in the payment of bills*	337	283	171	20
16	**MASALAH VOLTAN DI LUAR TAHAP DIISYTIHARKAN**	***VOLTAGE PROBLEM DUE TO OVER/UNDER VOLTAGE***				
16.1	**TIDAK MEMERLUKAN PENGUKUHAN SISTEM**	***DOES NOT REQUIRE SYTEM IMPROVEMENT***				
16.1.1	Bilangan aduan	*Number of complaint*	3, 307	0	175	20
16.1.2	Bilangan aduan yang diselesaikan dalam tempoh 2 hari dari tarikh aduan dibuat	*Number of complaint resolved within 2 days from the date of complaint received*	81, 647	94, 772	106, 957	140, 563
16.1.3	Peratus bilangan aduan yang diselesaikan dalam tempoh 2 hari dari tarikh aduan dibuat	*Percentage of complaint resolved within 2 days from the date of complaint received*	96.00%	0.00%	100.00%	100.00%
16.2	**MEMERLUKAN PENGUKUHAN SISTEM**	***REQUIRES SYSTEM IMPROVEMENT***				
16.2.1	Bilangan aduan	*Number of complaint*	104	117	183	50
16.2.2	Bilangan aduan yang diselesaikan dalam tempoh 3 bulan dari tarikh aduan dibuat	*Number of complaint resolved within 3 months from the date of complaint received*	104	117	182	57
16.2.3	Peratus bilangan aduan yang diselesaikan dalam tempoh 3 bulan tarikh dibuat	*Percentage of complaint resolved within 3 months from the date of complaint received*	94.74%	100.00%	99.45%	95%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
17	**JAWAPAN KEPADA PERMOHONAN BEKALAN BARU/PENINGKATAN BEKALAN**	***REPLY TO THE NEW SUPPLY APPLICATION/SUPPLY IMPROVEMENT***				
	Jawapan kepada permohonan bekalan termasuk tarikh bekalan akan diberi dan anggaran caj sambungan akan dikemukankepada pelanggan secara bertulis	*Replies of application including the date of supply and the estimation of connection charges that will be submitted to consumer in written*				
17.1	**TIDAK MEMERLUKAN PENCAWANG BARU**	***NOT REQUIRE NEW SUBSTATION***				
17.1.1	Bilangan permohonan	*Number of application*	3, 307	3, 273	1, 136	1, 533
17.1.2	Bilangan permohonan yang dijawab dalam 1 minggu dari tarikh permohonan dibuat	*Number of application replied within 1 weeks from the date of application*	3, 268	3, 265	1, 130	1, 530
17.1.3	Peratus bilangan permohonan yang dijawab dalam 1 minggu dari tarikh permohonan dibuat	*Percentage of application replied within 1 weeks from the date of application*	98.82%	99.76%	99.47%	99.80%
17.2	MEMERLUKAN PENCAWANG BARU	*REQUIRE NEW SUBSTATION*				
17.2.1	Bilangan permohonan	*Number of application*	104	110	82	39
17.2.2	Bilangan permohonan yang dijawab dalam 2 minggu dari tarikh permohonan dibuat	*Number of application replied within 2 weeks from the date of application*	104	110	82	38
17.2.3	Peratus bilangan permohonan yang dijawab dalam 1 minggu dari tarikh permohonan dibuat	*Percentage of application replied within 2 weeks from the date of application*	100.00%	100.00%	100%	97.44%

			TAHUN KEWANGAN *FINANCIAL YEAR*			
			2013/2014	**2014/2015**	**2015/2016**	**2016/2017**
18	**PERMOHONAN MEMINDAHKAN LOKASI METER OLEH PENGGUNA**	***METER RELOCATION REQUEST BY CONSUMER***				
18.1	Bilangan permohonan memindahkan lokasi meter oleh pengguna	*Number of application of meter relocation by the consumer*	97	64	28	301
18.2	Bilangan permohonan memindahkan lokasi meter oleh pengguna yang dirasakan perlu dan sesuai	*Number of application of meter relocation by the consumer which is necessary and appropriate*	75	52	26	300
18.3	Bilangan permohonan yang perlu dan dirasakan sesuai yang diselesaikan dalam tempoh 3 hari bekerja	*Number of necessary and appropriate application that completed within 3 working days*	6	33	37	118
18.4	Peratus bilangan permohonan yang dirasakan sesuai yang diselesaikan dalam tempoh 3 hari bekerja	*Percentage of necessary and appropriate application that completed within 3 working days*	337	283	171	20
19	**PENDIDIKAN PENGGUNA MENGENAI CARA PENGGUNAAAN ELEKTRIK DENGAN CEKAP DAN SELAMAT**	***CONSUMER EDUCATION PROGRAMME***				
19.1	Bilangan program pendidikan pengguna mengenai cara penggunaan elektrik dengan cekap dan selamat dan cara mengelakkan kemalangan elektrik, termasuk aktiviti berdekatan pepasangan dan talian elektrik yang dijalankan	*Number of consumer education programme on how to use electrity effectively and securely and how to avoid electrictiy accident including activities nearby installations and power lines that had been conducted*	19	14	14	14
20	**PENINGKATAN KUALITI BEKALAN**	***SUPPLY QUALITY IMPROVEMENT***				
20.1	Bilangan aktiviti-aktiviti berkaitan peningkatan kualiti bekalan elektrik	*Number of activities related to improve the quality of electricity supply*	114	183	163	212
		PURATA *AVERAGE*	97.00%	94.00	98.00	96.00

Apendiks 5: Tarif-tarif elektrik Tenaga Nasional Berhad (TNB) berkuatkuasa 1 Januari 2014
Appendix 5: Tenaga Nasional Berhad (TNB) electricity tariffs effective from 1 January 2014

Bil. *No.*	**Kategori Tarif** *Tariff Category*	**Unit**	**Kadar** *Rate*
1.	**Tarif A – Tarif Kediaman** *Tariff A – Domestic Tariff*		
	200 kWj pertama (1-200 kWj) sebulan *For the first 200 kWh (1-200 kWh) per month*	sen/kWj *sen/kWh*	21.80
	100 kWj berikutnya (201-300 kWj) sebulan *For the next 100 kWh (201-300 kWh) per month*	sen/kWj *sen/kWh*	33.40
	300 kWj berikutnya (301-600 kWj) sebulan *For the next 300 kWh (301-600 kWh) per month*	sen/kWj *sen/kWh*	51.60
	300 kWj berikutnya (601-900 kWj) sebulan *For the next 300 kWh (601-900 kWh) per month*	sen/kWj *sen/kWh*	54.60
	Setiap kWj berikutnya (901 kWj ke atas) sebulan *For the next kWh (901 and above) per month*	sen/kWj *sen/kWh*	57.10
	Caj minimum bulanan *Minimum monthly charge*	RM	3.00
2.	**Tarif B – Tarif Perdagangan Voltan Rendah** *Tariff B – Low Voltage Commercial Tariff*		
	200 kWj pertama (1-200 kWj) sebulan *For the first 200 kWh (1-200 kWh) per month*	sen/kWj *sen/kWh*	43.50
	Setiap kWj berikutnya (201 kWj ke atas) sebulan *For the next kWh (201 and above) per month*	sen/kWj *sen/kWh*	50.90
	Caj minimum bulanan *Minimum monthly charge*	RM	7.20
3.	**Tarif C1 – Tarif Perdagangan Am Voltan Sederhana** *Tariff C1 – Medium Voltage General Commercial Tariff*		
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	30.30
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	36.50
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
4.	**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	45.10
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	36.50
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	sen/kWj *sen/kWh*	22.40
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
5.	**Tarif D – Tarif Perindustrian Voltan Rendah** *Tariff D – Low Voltage Industrial Tariff*		
	200 kWj pertama (1-200 kWj) sebulan *For the first 200 kWh (1-200 kWh) per month*	sen/kWj *sen/kWh*	38.00
	Setiap kWj berikutnya (201 kWj ke atas) sebulan *For the next (201 and above) per month*	sen/kWj *sen/kWh*	44.10
	Caj minimum bulanan *Minimum monthly charge*	RM	7.20
	Tarif Ds – Tarif Perindustrian Khas (untuk pengguna yang layak sahaja) *Tariff Ds – Special Industrial Tariff (only for qualified consumers)*		
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	42.70
	Caj minimum bulanan *Minimum monthly charge*	RM	7.20
6.	**Tarif E1 – Tarif Perindustrian Am Voltan Sederhana** *Tariff E1 – Medium Voltage General Industrial Tariff*		

Bil. No.	Kategori Tarif *Tariff Category*	Unit	Kadar *Rate*
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	29.60
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	33.70
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
	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*	sen/kWj *sen/kWh*	23.70
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	33.60
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
7.	**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*	sen/kWj *sen/kWh*	37.00
	Bagi semua kWj dalam tempoh puncak puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	35.50
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	sen/kWj *sen/kWh*	21.90
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
	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	32.90
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	33.60
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	sen/kWj *sen/kWh*	19.10
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
8.	**Tarif E3 – Tarif Perindustrian Puncak/Luar Puncak Voltan Tinggi** *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	35.50
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	33.70
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	sen/kWj *sen/kWh*	20.20
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
	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	29.00
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	31.70
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	sen/kWj *sen/kWh*	17.50
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
9.	**Tarif F – Tarif Perlombongan Voltan Rendah** *Tariff F – Low Voltage Mining Tariff*		
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	38.10
	Caj minimum bulanan *Minimum monthly charge*	RM	120.00

Bil. No.	Kategori Tarif *Tariff Category*	Unit	Kadar *Rate*
10.	**Tarif F1 – Tarif Perlombongan Am Voltan Sederhana** *Tariff F1 – Medium Voltage General Mining Tariff*		
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	21.10
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	31.30
	Caj minimum bulanan *Minimum monthly charge*	RM	120.00
11.	**Tarif F2 – Tarif Perlombongan Puncak/Luar Puncak Voltan Sederhana** *Tariff F2– Medium Volatge 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	29.80
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	31.30
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	sen/kWj *sen/kWh*	17.20
	Caj minimum bulanan *Minimum monthly charge*	RM	120.00
12.	**Tarif G – Tarif Lampu Jalanraya** *Tariff G – Street Lighting Tariff*		
	Bagi semua kWj (termasuk senggaraan) *For all kWh (including maintenance)*	sen/kWj *sen/kWh*	30.50
	Bagi semua kWj (tidak termasuk senggaraan) *For all kWh (excluding maintenance)*	sen/kWj *sen/kWh*	19.20
	Caj minimum bulanan *Minimum monthly charge*	RM	7.20
13.	**Tarif G1 – Tarif Lampu Neon & Lampu Limpah** *Tariff G1 – Neon & Floodlight Tariff*		
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	20.80
	Caj minimum bulanan *Minimum monthly charge*	RM	7.20
14.	**Tarif H - Tarif Pertanian Spesifik Voltan Rendah** *Tariff H – Low Voltage Specific Agriculture Tariff*		
	200 kWj pertama (1-200 kWj) sebulan *For the first 200 kWh (1-200 kWh) per month*	sen/kWj *sen/kWh*	39.00
	Setiap kWj berikutnya (201 kWj ke atas) sebulan *For the next kWh (201 kWh and above) per month*	sen/kWj *sen/kWh*	47.20
	Caj minimum bulanan *Minimum monthly charge*	RM	7.20
15.	**Tarif H1 – Tarif Pertanian Spesifik Am Voltan Sederhana** *Tariff H1 – Medium Voltage General Specific Agriculture Tariff*		
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	30.30
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	35.10
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00
16.	**Tarif H2 – Tarif Pertanian Spesifik Puncak/Luar Puncak Voltan Sederhana** *Tariff 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	40.80
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	36.50
	Bagi semua kWj dalam tempoh luar puncak For all kWh *during the off- peak period*	sen/kWj *sen/kWh*	22.40
	Caj minimum bulanan *Minimum monthly charge*	RM	600.00

Apendiks 6: Tarif-tarif elektrik Tenaga Nasional Berhad (TNB) untuk top-up dan standby (Cogenerators sahaja)

Appendix 6: Tenaga Nasional Berhad (TNB) electricity tariffs for top-up and standby (Cogenerators only)

Bil. *No.*	**Kategori Tarif** *Tariff Category*	**Unit**	**Kadar** *Rate*	**Standby**
1.	**Tarif C1 – Perdagangan Am Voltan Sederhana** *Tariff C1 – Medium Voltage General Commercial Tariff*			
	Tarif C1 – Perdagangan Am Voltan Sederhana *For each kilowatt of maximum demand per month*	RM/kW	30.30	14.00
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	36.50	
2.	**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	45.10	14.00
	Bagi semua kWj dalam tempoh puncak puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	36.50	
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	sen/kWj *sen/kWh*	22.40	
3.	**Tarif E1 – Perindustrian Am Voltan Sederhana** *Tariff E1 – Medium Voltage General Industrial Tariff*			
	Bagi setiap kilowatt kehendak maksimum *sebulan For each kilowatt of maximum demand per month*	RM/kW	29.60	14.00
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	33.70	
4.	**Tarif E2 – 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	37.00	14.00
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	35.50	
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	sen/kWj *sen/kWh*	21.90	
5.	**Tarif E3 – Perindustrian Puncak/Luar Puncak Voltan Tinggi** *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	35.50	12.00
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	33.70	
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	sen/kWj *sen/kWh*	20.20	
6.	**Tarif F1 – Perlombongan Am Voltan Sederhana** *Tariff F1 - Medium Voltage General Mining Tariff*			
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	21.10	14.00
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	31.30	
7.	**Tarif F2 – 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/kW	29.80	14.00
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	31.30	
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	sen/kWj *sen/kWh*	17.20	

Bil. No.	Kategori Tarif *Tariff Category*	Unit	Kadar *Rate*	Standby
8.	**Tarif H1 – Tarif Pertanian Spesifik Am Voltan Sederhana** *Tariff H1 – Medium Voltage Specific General Agriculture Tariff*			
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	30.30	14.00
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	35.10	
9.	**Tarif H2 – Tarif Pertanian Spesifik Am Puncak/Luar Puncak** *Tariff H1 – Medium Voltage Specific General 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	40.80	14.00
	Bagi semua kWj dalam tempoh puncak puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	36.50	
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off- peak period*	RM/kW	22.40	

a) Semua pengguna *cogeneration* baru dan pengguna *cogeneration* sedia ada yang berhasrat untuk menukar kepada kadar *Standby* yang baru ini *All new cogeneration customers and existing cogeneration customers who wish to migrate to this new Standby rate.*

b) Bagi pengguna *cogeneration* sedia ada yang berhasrat untuk mengekalkan kadar *Standby* (*Firm* dan *Non-Firm*) yang lama, kadar *Standby* (*Firm* dan *Non-Firm*) yang lama bersama-sama kadar *Top-up* yang baru (bermula 1 Januari 2014) akan digunapakai. *For existing cogeneration customer who wishes to maintain previous Standby (Firm and Non-Firm) rates, the rate is applicable together with the new Top-Up rate (as of 1 January 2014)*

c) Kutipan 1.6% *Feed-in Tariff* (FiT) akan dikenakan ke atas bil elektrik bulanan pengguna (kecuali pengguna Domestik yang menggunakan sehingga 300 kWj sebulan) berkuatkuasa mulai 1 Januari 2014. *Effective starting from 1 January, 2014, 1% Feed-in Tariff (FiT) for Renewable Energy Resources Fund (RE) is imposed on consumers' monthly electric bill (except for domestic consumers with consumption not exceeding 300 kWh per month)*

Apendiks 7: Tarif-tarif Elektrik Sabah Electricity Sdn. Bhd. (SESB) & Wilayah Persekutuan Labuan (Berkuatkuasa 1 Januari 2014)

Appendix 7: Sabah Electricity Sdn. Bhd. (SESB) & Federal Teritory of Labuan electricity tariffs (Effective from 1st January 2014)

Bil. *No.*	**Kategori Tarif** *Tariff Category*	**Unit**	**Kadar semasa** *current rate*
1.	**Tarif DM – Tarif Kediaman** *Tariff DM – Domestic Tariff*		
	100 kWj pertama (1-100 kWj) sebulan *For the first 100 kWh (1-100 kWh) per month*	sen/kWj *sen/kWh*	17.50
	100 kWj berikutnya (101-200 kWj) sebulan *For the next 100 kWh (101-200 kWh) per month*	sen/kWj *sen/kWh*	18.50
	300 kWj berikutnya (201-300 kWj) sebulan *For the next 300 kWh (201-300 kWh) per month*	sen/kWj *sen/kWh*	33.00
	200 kWj berikutnya (301-500 kWj) sebulan *For the next 200 kWh (301-500 kWh) per month*	sen/kWj *sen/kWh*	44.50
	500 kWj berikutnya (501-1000 kWj) sebulan *For the next 500 kWh (501-1000 kWh) per month*	sen/kWj *sen/kWh*	45.00
	Setiap kWj berikutnya (1001 kWj ke atas) sebulan *For the next kWh (1001 kWh and above) per month*	sen/kWj *sen/kWh*	47.00
	Caj minimum bulanan *Minimum monthly charge*	RM/kW	5.00
2.	**Tarif CM1 – Tarif Perdagangan Voltan Rendah** *Tariff CM1 – Low Voltage Commercial Tariff*		
	200 kWj pertama (1-200 kWj) sebulan *For the first 200 kWh (1-200 kWh) per month*	sen/kWj *sen/kWh*	38.50
	Setiap kWj berikutnya (201 kWj ke atas) sebulan *For the next kWh (201 kWh and above) per month*	sen/kWj *sen/kWh*	39.50
	Caj minimum bulanan *Minimum monthly charge*	RM	15.00
3.	**Tarif CM2 – Perdagangan Am Voltan Sederhana** *Tariff CM2 – Medium Voltage General Commercial Tarif*		
	Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM/kW	23.20
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	32.40
	Caj minimum bulanan *Minimum monthly charge*	RM	1,000.00
4.	**Tarif CM3 – Tarif Perdagangan** *Tariff CM3 – Commercial Tariff*		
	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	32.60
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	32.40
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	sen/kWj *sen/kWh*	19.50
	Caj minimum bulanan *Minimum monthly charge*	RM	1,000.00
5.	**Tarif ID1 – Tarif Perindustrian Voltan Rendah** *Tariff ID1 – Low Voltage Industrial Tariff*		
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	37.6
	Caj minimum bulanan *Minimum monthly charge*	RM	15.00
6.	**Tarif F1 – Perlombongan Am Voltan Sederhana** *Tariff F1 - Medium Voltage General 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	21.75

Bil. *No.*	**Kategori Tarif** *Tariff Category*	**Unit**	**Kadar semasa** *current rate*
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	26.80
	Caj minimum bulanan *Minimum monthly charge*	RM	1,000.00
7.	**Tarif ID3 – Tarif Perindustrian Puncak/Luar Puncak Voltan Sederhana** *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*	sen/kWj *sen/kWh*	28.00
	Bagi semua kWj dalam tempoh puncak *For all kWh during the peak period*	sen/kWj *sen/kWh*	28.60
	Bagi semua kWj dalam tempoh luar puncak *For all kWh during the off-peak period*	RM	18.00
	Caj minimum bulanan *Minimum monthly charge*	RM	1,000.00
8.	**Tarif PL – Tarif Lampu Jalanraya** *Tariff PL – Public Lighting*		
	Bagi semua kWj (Tidak termasuk senggaraan) *For all kWh (excluding maintenance)*	sen/kWj *sen/kWh*	20.30
	Bagi semua kWj (termasuk senggaraan) *For all kWh (including maintenance)*	sen/kWj *sen/kWh*	36.30
	Caj minimum bulanan *Minimum monthly charge*	RM	15.00

Apendiks 8: Tarif-tarif elektrik Sarawak Energy Berhad (SEB)
Appendix 8: Sarawak Energy Berhad (SEB) electricity tariffs

Kategori Tarif *Tariff Category*	**Kadar Per Unit** *Rate Per Unit*
TARIF C1 - KOMERSIL *TARIFF C1 - COMMERCIAL*	
1 - 100 unit *units*	20.0 sen
1 - 200 unit *units*	24.0 sen
1 - 300 unit *units*	26.0 sen
1 - 400 unit *units*	28.0 sen
1 - 500 unit *units*	30.0 sen
1 – 3,000 unit *units*	31.5 sen
1 – 10,000 unit *units*	32.0 sen
1 – 20,000 unit *units*	31.0 sen
1- Melebihi 20,000 unit *1 - Above 20,000 units*	30.0 sen
Caj minimum bulanan *Minimum monthly charge*	RM10.00
TARIF C2 - KEHENDAK PERDAGANGAN *TARIFF C2 - COMMERCIAL DEMAND*	
Semua penggunaan *All consumption*	24.5 sen
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM16.00
Caj minimum *bulanan Minimum monthly charge*	RM 16.00 per kilowatt X Kehendak Bil *RM 16.00 per kilowatt X Billing Demand*
TARIF C3 - KEHENDAK WAKTU PUNCAK / BUKAN WAKTU PUNCAK PERDAGANGAN *TARIFF C3 - COMMERCIAL PEAK/OFF-PEAK DEMAND*	
Bagi setiap unit waktu puncak *For each unit during the peak period*	24.5 sen
Bagi setiap unit bukan waktu puncak For *each unit during the off-peak period*	13.9 sen
Bagi setiap kilowatt kehendak maksimum sebulan semasa waktu puncak *For each kilowatt of maximum demand per month during the peak period*	RM20.00
Caj minimum *bulanan Minimum monthly charge*	RM 20.00 per kilowatt X Kehendak Bil *RM 20.00 per kilowatt X Billing Demand*

Kategori Tarif *Tariff Category*	**Kadar Per Unit** *Rate Per Unit*
TARIF D - DOMESTIK *TARIFF D - DOMESTIC*	
Bagi 1 hingga 100 unit sebulan *1 to 100 units per month*	18 sen
Bagi 1 hingga 150 unit sebulan *For 1 to 150 units per month*	18 sen
Bagi 1 hingga 200 unit sebulan *For 1 to 200 units per month*	22 sen
Bagi 1 hingga 300 unit sebulan *For 1 to 300 units per month*	25 sen
Bagi 1 hingga 400 unit sebulan *For 1 to 400 units per month*	27 sen
Bagi 1 hingga 500 unit sebulan *For 1 to 500 units per month*	29.5 sen
Bagi 1 hingga 700 unit sebulan *For 1 to 700 units per month*	30 sen
Bagi 1 hingga 800 unit sebulan *For 1 to 800 units per month*	30.5 sen
Bagi 1 hingga 1,300 unit sebulan *For 1 to 1,300 units per month*	31 sen
Bagi 1 hingga 100 unit sebulan *For above 1,300 units per month*	31.5 sen
Caj minimum *bulanan Minimum monthly charge*	RM5.00
TARIF I1 - PERINDUSTRIAN *TARIFF I1 - INDUSTRIAL*	
1 - 100 unit *units*	24.0 sen
1 – 3,000 unit *units*	25.0 sen
1- melebihi 3,000 unit *1 - Above 3,000 units*	26.0 sen
Caj minimum *bulanan Minimum monthly charge*	RM10.00
TARIF I2- KEHENDAK PERINDUSTRIAN *TARIFF I2 - INDUSTRIAL DEMAND*	
Semua penggunaan *All consumption*	21.7 sen
Bagi setiap kilowatt kehendak maksimum sebulan *For each kilowatt of maximum demand per month*	RM16.00
Caj minimum *bulanan Minimum monthly charge*	RM 16.00 per kilowatt X Kehendak Bil *RM 16.00 per kilowatt X Billing Demand*
TARIF I3 - KEHENDAK WAKTU PUNCAK/BUKAN WAKTU PUNCAK PERINDUSTRIAN *TARIFF I3 - INDUSTRIAL PEAK/OFF-PEAK DEMAND*	
Bagi setiap unit waktu puncak *For each unit during the peak period*	22.9 sen
Bagi setiap unit bukan waktu puncak *For each unit during the off-peak period*	13.9 sen
Bagi setiap kilowatt kehendak maksimum sebulan semasa waktu puncak *For each kilowatt of maximum demand per month during the peak period*	RM20.00
Caj minimum *bulanan Minimum monthly charge*	RM 20.00 per kilowatt X Kehendak Bil *RM 20.00 per kilowatt X Billing Demand*
TARIF PL - LAMPU AWAM *TARIFF PL - PUBLIC LIGHTING*	
Bagi setiap unit *For each unit*	47 sen
Caj minimum *bulanan Minimum monthly charge*	RM10.00

Apendiks 9: Harga jualan purata syarikat utiliti kuasa utama mengikut sektor
Appendix 9: Average selling prices of major power utility companies by sectors

Syarikat *Company*	**Harga jualan purata (sen/kWj)** *Average selling prices (sen/kWh)*				
	2013	**2014**	**2015**	**2016**	**2017**
TNB					
Domestik *Domestic*	29.15	32.28	32.67	33.21	32.87
Komersil *Commercial*	40.76	47.10	47.68	46.76	47.16
Industri *Industrial*	31.00	35.88	36.56	37.13	36.97
Perlombongan *Mining*	20.55	23.99	25.00	25.34	25.07
Lampu awam *Public lighting*	21.55	25.06	25.49	25.57	25.53
Pertanian *Agriculture*	39.35	45.29	45.86	45.78	45.54
Purata *Average*	**33.87**	**38.86**	**39.45**	**39.55**	**39.53**
SESB					
Domestik *Domestic*	25.30	29.32	29.14	28.86	28.39
Komersil *Commercial*	33.59	39.25	37.63	38.21	38.26
Industri *Industrial*	28.81	32.90	30.80	31.36	31.09
Lampu awam *Public lighting*	18.75	23.31	22.54	23.09	23.27
Purata *Average*	**29.60**	**34.31**	**33.13**	**33.41**	**33.30**
SEB					
Domestik *Domestic*	31.30	31.30	28.25	28.30	28.21
Komersil *Commercial*	32.00	32.00	31.72	30.53	30.54
Industri *Industrial*	25.10	25.10	24.48	24.15	23.86
Lampu awam *Public lighting*	47.10	47.10	n/a	47.12	47.18
Purata *Average*	**29.90**	**29.80**	**28.50**	**28.20**	**28.04**

Apendiks 10: Kos penjanaan Tenaga Nasional Berhad (TNB)
Appendix 10: Generation costs of Tenaga Nasional Berhad (TNB)

KOS PENJANAAN (sen/kWj) *GENERATION COST (sen/kWh)*	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017
(a) Penjanaan sendiri *Own Generation*	20.13	18.6	18.03	20.65	22.62
(b) Elektrik dibeli *Purchased Electricity*	22.8	20.93	20.21	20.01	23.02
(c) Kos keseluruhan (a) & (b) *Overall cost (a) & (b)*	**23.03**	**23.94**	**22.03**	**20.15**	**22.95**

Nota • *Notes:*
Data Tahun Kewangan *Financial Year data*
Kos (kapasiti, tenaga) / Jumlah Penjanaan Tenaga (bagi IPP, menggunakan syarat yang termaktub dalam PPA/SLA)
Cost (capacity, energy)/ Total Units Generated (for IPP, based on condition stipulated in PPA/SLA)

Apendiks 11: Kos penjanaan Sabah Electricity Sdn. Bhd. (SESB)
Appendix 11: Generation costs of Sabah Electricity Sdn. Bhd. (SESB)

KOS PENJANAAN (sen/kWj) *GENERATION COST (sen/kWh)*	2013	2014	2015	2016	2017
(a) Penjanaan sendiri *Own Generation*	17.84	25.34	27.49	24.57	26.23
(b) Elektrik dibeli *Purchased Electricity*	20.04	22.75	20.76	19.17	19.33
(c) Kos keseluruhan (a) & (b) *Overall cost (a) & (b)*	**19.38**	**20.47**	**22.01**	**20.55**	**20.39**

Nota • *Note:*
Kos penjanaan di atas adalah berdasarkan harga bahan api dengan subsidi (bagi diesel & MFO) dan subsidi melalui KWTBB (SEDA) bagi Tenaga Boleh Baharu di bawah skim FiT. Harga gas bagi Sabah & Wilayah Persekutuan Labuan adalah pada RM6.40/mmbtu. *The above generation costs are based on fuel prices with subsidies (for diesel & MFO) and subsidies through KWTBB (SEDA) for Renewable Energy under the FiT scheme. Gas prices for Sabah & Federal Territory of Labuan is at RM6.40 / mmbtu.*

Apendiks 12: Kos penjanaan Sarawak Energy Berhad (SEB)
Appendix 12: Generation costs of Sarawak Energy Berhad (SEB)

KOS PENJANAAN (sen/kWj) *GENERATION COST (sen/kWh)*	2013	2014	2015	2016	2017
(a) Penjanaan sendiri *Own Generation*	11.58	15.62[1]	13.10[1]	5.99[1]	n/a
(b) Elektrik dibeli *Purchased Electricity*	10.75	9.96[2]	11.80[2]	10.47[2]	n/a
(c) Kos keseluruhan (a) & (b) *Overall cost (a) & (b)*	**10.85**	**10.57[3]**	**11.90[3]**	**8.42[3]**	**n/a**

Nota • *Notes:*
[1] Kos Sumber Tenaga SESCO *SESCO Energy Source Cost*
[2] Kos Pembelian Tenaga *Power Purchase Cost*
[3] Purata Kos Sumber Tenaga *Average Energy Source Cost*

Berikutan penstrukturan semula SEB pada tahun 2011, kos penjanaan SEB turut mengambilkira kos penjanaan Sejingkat Power Corporation, Sarawak Power Corporation, PPLS Power Generation dan Mukah Power Generation *Due to restructuring of SEB in 2011, SEB's generation cost considers the generation cost of Sejingkat Power Corporation, Sarawak Power Corporation, PPLS Power Generation and Mukah Power Generation*

Pengurangan ketara dalam kos keseluruhan pada tahun 2016 adalah disebabkan kekurangan daripada Bakun dari tahun 2015 hingga 2016. Tenaga elektrik yang dibeli adalah di bawah tahap minimum *The significant decrease in the overall cost in 2016 was due to inclusion of Bakun shortfall from 2015 to 2016. The power purchased was below the minimum threshold*

Apendiks 13: Statistik liputan projek bekalan elektrik luar bandar (2011-2017)
Appendix 13: Statistics of rural electrification project coverage (2011-2017)

Kawasan *Region*	**Bilangan rumah disambung Bekalan Elektrik Luar Bandar (BELB)** *Number of houses connected with Rural Electricfication Project*													
	Sasaran *Target*	**Pencapaian** *Achievement*	**Sasaran** *Target*	**Pencapaian** *Achievement*	**Sasaran** *Target*	**Pencapaian** *Achievement*	**Sasaran** *Target*	**Pencapaian** *Achievement*	**Sasaran** *Target*	**Pencapaian** *Achievement*	**Sasaran** *Target*	**Pencapaian** *Achievement*	**Sasaran** *Target*	**Pencapaian** *Achievement*
Tahun *Year*	**2011**		**2012**		**2013**		**2014**		**2015**		**2016**		**2017**	
Sem. Malaysia *Peninsular Malaysia*	581	6,713	3,037	3,366	1,336	1,385	1,644	1,540	1,235	1,243	375	375	375	379
Sabah	4,509	8,248	15,455	15,563	7,735	7,740	4,151	4,227	3,584	3,605	5,000	5,000	3,396	2,703
Sarawak	21,792	12,043	20,950	22,101	10,740	10,745	8,500	8,532	8,500	9,582	4,500	4,546	4,500	5,068
Jumlah ***Total***	**26,882**	**27,004**	**39,442**	**41,030**	**19,811**	**19,870**	**14,295**	**14,299**	**13,319**	**14,430**	**9,875**	**9,921**	**8,271**	**8,110**

Sumber • *Notes:*
Kementerian Kemajuan Luar Bandar dan Wilayah *Ministry of Rural and Regional Development*

Apendiks 14: Senarai pemegang lesen projek tenaga boleh baharu (TBB) di Semenanjung Malaysia (lesen yang dikeluarkan pada 2017 dan aktif setakat 31 Disember 2017)

Appendix 14: List of renewable energy (RE) projects licencees in Peninsular Malaysia (licenses issued in 2017 and active as of 31 December 2017)

Bil. *No.*	**Nama pemegang lesen** *Licensee's name*	**Alamat pepasangan** *Installation address*	**Negeri** *State*	**Alamat surat menyurat** *Mailing address*	**Tempoh sah lesen** *License validity*		**Kapasiti (MW)** *Capacity (MW)*	**Jenis loji** *Plant type*	**Sumber tenaga** *Energy source*
					Dari *From*	**Hingga** *Until*			
1.	Advance Project Management Sdn. Bhd.	Sebahagian Lot PT 2310, Mukim Endau, Daerah Rompin, 26800 Pahang.	Pahang	No. 65a, Wisma Kim Too, Jalan Loke Yew,55200 Kuala Lumpur Wilayah Persekutuan	9/1/2017	8/1/2033	2.40	Enjin gas *Gas engine*	Biogas
2.	Aliran Tokoh Sdn. Bhd.	Sebahagian Lot 2080, Mukim Jimah, 71000 Port Dickson, Negeri Sembilan.	Negeri Sembilan	No 65, Jalan Bp 5, Bandar Bukit Puchong,47100 Puchong Selangor	5/10/2017	4/10/2038	0.425	Solar PV	Solar
3.	Amazing Paradigm Sdn. Bhd.	Sebahagian Lot Pt 67894, Mukim Klang, 42920 Klang, Selangor	Selangor	Lot 6, Jalan 51a/223,46100 Petaling Jaya Selangor	27/10/2017	26/10/2038	0.425	Solar PV	Solar
4.	Antah Sri Radin Sdn. Bhd.	Sebahagian Lot 22, Seksyen 36, Mukim Bandar Petaling Jaya, Daerah Petaling, 46300 Selangor.	Selangor	3, Jalan 19/1,46300 Petaling Jaya, Selangor	3/1/2017	2/1/2038	0.3	Solar PV	Solar
5.	Asian Link Associate Industrial Sdn. Bhd.	Lot 14906, Mukim Sungai Siput, Daerah Kuala Kangsar, 31100 Kuala Kangsar, Perak	Perak	483, Kawasan Industri,31100 Sungai Siput Perak	11/10/2017	10/10/2038	0.35	Solar PV	Solar
6.	Ban Hock Leong Trading Sdn. Bhd.	Sebahagian Lot 1215, Mukim Bandar Alor Setar, Daerah Kota Setar, 05150 Kedah	Kedah	1001-1002, 1st Floor Kompleks Sri Putra Seberang Jalan Putera 05150 Alor Setar Kedah	16/10/2017	15/10/2038	0.134	Solar PV	Solar
7.	Betatechnic Sdn. Bhd.	Sebahagian Lot No. Pt 1576, Mukim Jelai, Daerah Jempol,72100 Negeri Sembilan.	Negeri Sembilan	Wisma Taiko, No.1, Jalan SP Seenivasagam,30000 Ipoh Perak	7/3/2017	6/3/2033	1.2	Enjin gas *Gas engine*	Biogas
8.	BSH Trading Sdn. Bhd.	Lot 1704, Pekan Napoh, Kubang Pasu, 06000 Kedah.	Kedah	Lot 718, No.1, Pekan Napoh, Jalan Changlun, Mukim Hosba, 06000 Jitra Kedah	22/2/2017	21/2/2038	0.179	Solar PV	Solar
9.	C&I Tiram Food Sdn. Bhd.	Lot 309, Mukim Plentong, Johor Bahru, 81800 Johor Bahru, Johor	Johor	No 4A Tingkat 1, Jalan Skudai Kiri, Kg. Skudai Kiri, Off Jalan Skudai Batu 4 ½, 81200 Johor Bahru Johor	6/12/2017	5/12/2038	0.424	Solar PV	Solar
10.	C. S. E. Sdn. Bhd.	Lot 652, Mukim Bandar Serdang, Daerah Bandar Baharu, 09800 Kedah	Kedah	10-G, 11-G, Kompleks Umno,09800 Serdang Kedah	24/8/2017	23/8/2038	0.425	Solar PV	Solar

Bil. *No.*	**Nama pemegang lesen** *Licensee's name*	**Alamat pepasangan** *Installation address*	**Negeri** *State*	**Alamat surat menyurat** *Mailing address*	**Tempoh sah lesen** *License validity*		**Kapasiti (MW)** *Capacity (MW)*	**Jenis loji** *Plant type*	**Sumber tenaga** *Energy Source*
					Dari *From*	**Hingga** *Until*			
11.	Chuan Luck Sdn. Bhd.	Sebahagian Lot PTD 102015, Mukim Kulai, Daerah Kulaijaya, 81400 Johor.	Johor	No. 6-02, Jalan Sri Perkasa 1/3, Taman Tampoi Utama,81200 Johor Bahru Johor	15/8/2017	14/8/2038	0.18	Solar PV	Solar
12.	Conlex Enterprise Sdn. Bhd.	Sebahagian No. Lot 8909, Mukim Klang, Daerah Klang, 42000 Selangor	Selangor	Lot 15786, No. 69 Lengkuk Selat Selatan Off Jalan Banting, Pandamaran 42000 Pelabuhan Klang Selangor	9/10/2017	8/10/2038	0.425	Solar PV	Solar
13.	Contour Mechanism Sdn. Bhd.	Hutan Simpan Kekal Batu Talam, Mukim Sungai Liang, Daerah Raub, 27600 Pahang	Pahang	2-01, Pj Tower Amcorp Trade Centre No. 18, Jalan Persiaran Barat 46050 Petaling Jaya Selangor	27/10/2017	26/10/2038	10.566	Hidro *Hydro*	Hidro *Hydro*
14.	Dazzling Harvest Sdn. Bhd.	Lot 1231, Mukim Jeram Batu, Daerah Pontian, 81500 Johor	Johor	18 Jalan Wawasan 4/11 Pusat Bandar Puchong 47100 Puchong Selangor	27/10/2017	26/10/2038	0.18	Solar PV	Solar
15.	Deluxe Attraction Sdn. Bhd.	Sebahagian PT 853, Pekan Baru Hicom, 40400 Daerah Petaling, Selangor.	Selangor	Lot 30462, Jalan Kempas Baru, 81200 Johor Bahru Johor	6/12/2017	5/12/2038	0.3285	Solar PV	Solar
16.	Dialog Murni Sdn. Bhd.	Lot 421, Mukim Titi Tinggi, Daerah Kok Mak, 02100 Padang Besar.	Perlis	No 1010-1012, Kompleks Sri Putra, Seberang Jalan Putra, 05150 Alor Setar Kedah	12/7/2017	11/7/2038	0.425	Solar PV	Solar
17.	Distance Solar Energy Sdn. Bhd.	Sebahagian Lot PT 279, Jalan Gunong Keriang, Mukim Gunong, Daerah Kota Setar, 06570 Kedah.	Kedah	4166-4168, Jalan Gading 2, Taman Gading, Jalan Langgar, 05460 Alor Setar Kedah	24/8/2017	23/8/2038	0.18	Solar PV	Solar
18.	Ditrolic Sdn. Bhd.	Ptd 117036, Lot 1101, Tebrau Johor Bahru, 81100 Johor	Johor	89-01 Jalan Ros Merah Tiga/1, Taman Johor Jaya 81100 Johor Bahru Johor	11/10/2017	10/11/2038	0.18	Solar PV	Solar
19.	Eng Marks Oils & Fats Sdn. Bhd.	Lot PT 853, Mukim Bagan Serai, Daerah Kerian, 34300 Bagan Serai, Perak	Perak	504-D4, Kg Pandan 2 Batu 7 ½, Jalan Gambang 26070 Kuantan Pahang	13/12/2017	12/12/2038	0.1779	Solar PV	Solar
20.	Eng Thai Sdn. Bhd.	Sebahagian Lot 1154, Mukim Titi Tinggi, Daerah Perlis, 02100 Perlis.	Perlis	Lot 1154, Batu 22, Jalan Padang Besar, 02100 Padang Besar Perlis	24/8/2017	23/8/2038	0.175	Solar PV	Solar

Bil. No.	Nama pemegang lesen *Licensee's name*	Alamat pepasangan *Installation address*	Negeri *State*	Alamat surat menyurat *Mailing address*	Tempoh sah lesen *License validity*		Kapasiti (MW) *Capacity (MW)*	Jenis loji *Plant type*	Sumber tenaga *Energy Source*
					Dari *From*	Hingga *Until*			
21.	Ever Delicious Food Industries Sdn. Bhd.	1740 Mukim Pernu Melaka Tengah 75460 Melaka	Melaka	No. 7 (1st Floor) Jalan Pesta 1/1, Taman Tun Dr. Ismail 1 Jalan Bakri, 84000 Muar Johor	29/11/2017	28/11/2038	0.18	Solar PV	Solar
22.	Evermal Industry Sdn. Bhd.	Sebahagian Lot 1663, Mukim Rimba Terjun, Daerah Pontian, 82000 Pontian, Johor.	Johor	Plo 92, Jalan Cyber 7 Kawasan Perindustrian Senai III 81400 Senai Johor	11/12/2017	10/12/2038	0.425	Solar PV	Solar
23.	Felda Palm Industries Sdn. Bhd.	Kilang Sawit Keratong 9, Peti Surat 32, 26900 Rompin, Pahang	Pahang	Level 19 Menara Felda, Platinum Park, No 11 Persiaran KLCC,50088 Kuala Lumpur Wilayah Persekutuan	28/8/2017	27/8/2033	2.4	Enjin gas *Gas engine*	Biogas
24.	Future Biomass Gasification Sdn. Bhd.	Mo. Lot PT7213, Mukim Tawar, 09300 Baling, Kedah.	Kedah	Wisma Fitters, No.1, Jalan Tembaga SD5/2, Bandar Sri Damansara, 52200 Kuala Lumpur, Wilayah Persekutuan	18/5/2017	17/5/2033	2.4	Enjin gas *Gas engine*	Biogas
25.	Gan Teng Siew Realty Sdn. Bhd.	Sebahagian Lot 422, Mukim Rantau, Daerah Seremban, 71209 Negeri Sembilan.	Negeri Sembilan	Tingkat 10, Bangunan Yee Seng, No. 15 Jalan Raja Chulan,50200 Kuala Lumpur Wilayah Persekutuan	5/5/2017	4/5/2033	1.56	Enjin gas *Gas engine*	Biogas
26.	Globrant Holdings Sdn. Bhd.	Sebahagian No. Lot 4946 (Pt2463), Mukim Panchor, Daerah Jajahan Kota Bharu, 16100 Kelantan.	Kelantan	C/O Ain Medicare Sdn. Bhd., Jalan 6/44, Kawasan Perindustrian Pengkalan Chepa 2, 16100 Kota Bharu Kelantan	11/10/2017	10/10/2038	0.27	Solar PV	Solar
27.	Glt Renewable Sdn. Bhd.	Sebahagian Lot No. PT 3992, Mukim Bebar, Derah Pekan, 26700 Pahang	Pahang	C-709 Metropolitan Square, Jalan PJU 8/1, Bandar Damansara Perdana, 47820 Petaling Jaya Selangor	1/3/2017	28/2/2033	2.196	Enjin gas *Gas engine*	Biogas
28.	Gorasia Industries Sdn. Bhd.	Lot 8268, Mukim Setul Daerah Seremban, 71800 Negeri Sembilan.	Negeri Sembilan	PT 3116, Jalan Permata 1/1, Arab Industrial Park 71800 Nilai Negeri Sembilan	29/11/2017	28/11/2038	0.18	Solar PV	Solar
29.	Green Earth Solar Sdn. Bhd.	Lot 1456, Belakang Simpang Rengam, Mukim Ulu Benut, 86200 Kluang, Johor	Johor	No.16, 1st Floor, Jalan Station, 86000 Kluang Johor	19/10/2017	18/10/2038	0.42442	Solar PV	Solar
30.	Jasrina Energy Sdn. Bhd.	Sebahagian Lot 277, Mukim Jeram Batu, Daerah Pontian, 81550 Pontian, Johor.	Johor	16-G-01 Rista Villa, Taman Putra Perdana, 47130 Puchong Selangor	12/9/2017	11/9/2038	0.2	Solar PV	Solar

Bil. *No.*	**Nama pemegang lesen** *Licensee's name*	**Alamat pepasangan** *Installation address*	**Negeri** *State*	**Alamat surat menyurat** *Mailing address*	**Tempoh sah lesen** *License validity*		**Kapasiti (MW)** *Capacity (MW)*	**Jenis loji** *Plant type*	**Sumber tenaga** *Energy Source*
					Dari *From*	**Hingga** *Until*			
31.	Jaya Pasifika Sdn. Bhd.	Sebahagian Lot PT30487, Bandar Sungai Petani, Daerah Kuala Muda, 08000 Kedah.	Kedah	Plot 147, Jln PKNK 3/1 Kaw Perusahaan LPK, Tmn Ria Jaya, 08000 Sungai Petani Kedah	17/7/2017	16/7/2038	0.425	Solar PV	Solar
32.	Kim Loong Power Sdn. Bhd.	Lot 2420, Mukim Ulu Sungei Sedili Besar, Daerah Kota Tinggi, 81900 Johor.	Johor	No. A042, Pekan Telupid, Peti Surat No. 27, 89300 Telupid Sabah	9/3/2017	8/3/2033	2.4	Enjin gas *Gas engine*	Biogas
33.	Komet Makmur Sdn. Bhd.	Sebahagian Lot 34, Seksyen 65, Mukim Bandar Sungai Petani, Daerah Kuala Muda, 08000 Sungai Petani, Kedah	Kedah	Lot 52 Jalan PKNK 1/6, Kawasan Perusahaan Sungai Petani, 08000 Sungai Petani Kedah	24/8/2017	23/8/2038	0.425	Solar PV	Solar
34.	Kualiti Alam Sdn. Bhd.	Lot 6638, Mukim Jimah, 71960 Daerah Port Dickson, Negeri Sembilan.	Negeri Sembilan	13-1, Mercu Uem, Jalan Sentral 5, Kuala Lumpur Sentral, 50470 Kuala Lumpur Wilayah Persekutuan	1/7/2017	30/6/2038	0.15	Solar PV	Solar
35.	Leaf Power Sdn. Bhd.	Sebahagian Lot 5281, Mukim 13, Daerah Seberang Perai Tengah, 14000 Pulau Pinang.	Pulau Pinang	L5-E-7a, Enterprise 4, Technology Park Malaysia, Lebuhraya Puchong-Sg Besi, Bukit Jalil 57000 Kuala Lumpur Wilayah Persekutuan	11/12/2017	10/12/2038	0.425	Solar PV	Solar
36.	Lean Lee Solar (M) Sdn. Bhd.	5279,534,5280 Mukim 13, Seberang Perai Tengah, 14000 Pulau Pinang.	Pulau Pinang	No 891, Jln Kpg Juru, Juru,14000 Bukit Mertajam Pulau Pinang	12/7/2017	11/7/2038	0.425	Solar PV	Solar
37.	Lotus Spectrum Sdn. Bhd.	Lot PT 17859, Kg. Sg Rasau, Bt 8 Puchong, 47120 Puchong, Selangor	Selangor	No 65, Jalan BP 5, Bandar Bukit Puchong 47100 Puchong Selangor	5/10/2017	4/10/2038	0.425	Solar PV	Solar
38.	Mackt Commerce Sdn. Bhd.	Sebahagian Lot 2717, Jalan Haji Othman Baru, Rantau Panjang, Klang, 42100 Selangor	Selangor	No. 5 Ground Floor, Bangunan TH, Jalan Bersatu 13/04, 46200 Petaling Jaya Selangor	3/10/2017	2/10/2038	0.425	Solar PV	Solar
39.	Manchu Spring Sdn. Bhd.	Sebahagian Lot 42358, Mukim Kapar, Daerah Klang, 42200 Selangor.	Selangor	6, Jalan Wawasan 1, Sungai Kapar Indah Industrial Park, 42200 Klang Selangor	8/8/2017	7/8/2038	0.4243	Solar PV	Solar
40.	Metro Havana Sdn. Bhd.	Sebahagian Lot 8080, Mukim Bebar, Daerah Pekan, 26700 Pahang.	Pahang	E11-07 & E11-08, Capital 5, No.2 Jalan PJU 1a/7a, Oasis Square, Oasis Damansara, 47301 Petaling Jaya Selangor	16/1/2017	15/1/2033	1.56	Enjin gas *Gas engine*	Biogas

Bil. No.	Nama pemegang lesen *Licensee's name*	Alamat pepasangan *Installation address*	Negeri *State*	Alamat surat menyurat *Mailing address*	Tempoh sah lesen *License validity*		Kapasiti (MW) *Capacity (MW)*	Jenis loji *Plant type*	Sumber tenaga *Energy Source*
					Dari *From*	Hingga *Until*			
41.	Milenium Designs Sdn. Bhd.	Sebahagian Dari Lot 3111 - 3113, Pengkalan Hulu, Hulu Perak, 33100 Perak	Perak	Unit 308 Blok A, Phileo Damansara Ii, No 15 Jln 16/11,46350 Petaling Jaya Selangor	8/8/2017	7/8/2038	0.4243	Solar PV	Solar
42.	Myangkasa Services Sdn. Bhd.	Lot 3375 Mukim Padang Kerbau Pendang 06750 Pendang Kedah	Kedah	No. 311, Block A, Glomac Business Centre Jalan Ss 6/3, Kelana Jaya 47301 Petaling Jaya Selangor	16/1/2017	15/1/2033	1.56	Solar PV	Solar
43.	Newera Equipment Supply Sdn. Bhd.	No Lot PT 56669, Mukim Klang, Daerah Klang, Selangor.	Selangor	No. 9, Jalan 201, P.O. Box 137, 46050 Petaling Jaya Selangor	16/10/2017	15/10/2038	0.425	Solar PV	Solar
44.	One Solar System Sdn. Bhd.	Sebahagian Lot 193, Mukim Rasa, Daerah Hulu Selangor, 44200 Selangor.	Selangor	No 65, Jalan Bp 5, Bandar Bukit Puchong 47100 Puchong Selangor	30/5/2017	29/5/2038	1.0	Solar PV	Solar
45.	Pelita Energy Sdn. Bhd.	Lot 1206-1210, Stadium Sultan Abdul Halim, Jln Suka Menanti, Kota Setar, Bandar Alor Merah, 05400 Kedah	Kedah	117-B Tingkat 1, Kompleks Alor Setar, 05100 Alor Setar Kedah	24/8/2017	23/8/2038	0.425	Solar PV	Solar
46.	Pembinaan Eastern Aluminium Sdn. Bhd.	Lot 58802, 58803, 58806, Jalan Pekeliling, Tanjung 27, Indahpura, Kulai, Kulaijaya, 81000 Johor.	Johor	No. 15 Jalan Angkasa Mas 5, Kawasan Perindustrian Tebrau Ii, 81100 Johor Bahru Johor	5/10/2017	4/10/2038	0.425	Solar PV	Solar
47.	Powerful Merger Sdn. Bhd.	Lot 370 Kota Setar Bandar Alor Setar 05100 Kedah	Kedah	71-2 Jalan Meda Setia 1 50490 Kuala Lumpur Wilayah Persekutuan	12/7/2017	11/7/2038	0.18	Solar PV	Solar
48.	Pua Lai Hwa Enterprise Sdn. Bhd.	Sebahagian Lot 2124, Mukim Linau, Daerah Batu Pahat, 83010 Johor	Johor	No. 11 Jalan Emas Jaya Taman Emas Jaya Tongkang Pechah 83010 Batu Pahat Johor	28/8/2017	27/8/2038	0.425	Solar PV	Solar
49.	Qpower Resources Sdn. Bhd.	No Lot 6562 Mukim Mentakab 28400 Temerloh Pahang	Pahang	No Lot 6562 Mukim Mentakab 28400 Temerloh Pahang	17/7/2017	16/7/2038	0.12	Solar PV	Solar
50.	Rk South Asia Sdn. Bhd.	PT 1074, Mukim 01, Daerah Seberang Perai Tengah, 13600 Seberang, Prai Pulau Pinang	Pulau Pinang	PT 1074, Mukim 01, Daerah Seberang Perai Tengah, 13600 Seberang, Prai Pulau Pinang	11/12/2017	10/12/2038	0.4224	Solar PV	Solar

Bil. No.	Nama pemegang lesen *Licensee's name*	Alamat pepasangan *Installation address*	Negeri *State*	Alamat surat menyurat *Mailing address*	Tempoh sah lesen *License validity*		Kapasiti (MW) *Capacity (MW)*	Jenis loji *Plant type*	Sumber tenaga *Energy Source*
					Dari *From*	Hingga *Until*			
51.	Sinar Lebar Sdn. Bhd.	Sebahagian Lot PT 366, Mukim Pekan Hicom,Daerah Petaling 40000 Selangor	Selangor	Plot 147, Jln PKNK 3/1 Kaw Perusahaan LPK, Tmn Ria Jaya, 08000 Sungai Petani Kedah	9/10/2017	8/10/2038	0.19	Solar PV	Solar
52..	Solar Management (Rembau Two) Sdn. Bhd.	Sebahagian Lot PT 2539, Mukim Pedas, Daerah Rembau, 71300 Negeri Sembilan.	Negeri Sembilan	No. A042, Pekan Telupid, Peti Surat No. 27, 89300 Telupid Sabah	29/11/2017	28/11/2038	0.425	Solar PV	Solar
53.	Solaris Boulevard Sdn. Bhd.	69287 Klang Klang 40460 Klang Selangor	Selangor	Lot 52 Jalan PKNK 1/6, Kawasan Perusahaan Sungai Petani, 08000 Sungai Petani Kedah	15/8/2017	14/8/2038	0.163	Solar PV	Solar
54.	Sun Sung Lee Engineering Sdn. Bhd.	Sebahagian Lot 360, Mukim 12, Daerah Seberang Perai Selatan, 14200 Pulau Pinang	Pulau Pinang	13-1, Mercu Uem, Jalan Sentral 5, Kuala Lumpur Sentral, 50470 Kuala Lumpur Wilayah Persekutuan	29/11/2017	28/11/2038	0.18	Solar PV	Solar
55.	Suriachem Sdn. Bhd.	Sebahagian Lot PT 119994, Mukim Klang Daerah Klang, 42000 Selangor	Selangor	L5-E-7a, Enterprise 4, Technology Park Malaysia, Lebuhraya Puchong-Sg Besi, Bukit Jalil 57000 Kuala Lumpur Wilayah Persekutuan	19/10/2017	18/9/2038	0.425	Solar PV	Solar
56.	Synway Enterprise Sdn. Bhd.	Sebahagian Lot 350, Mukim Sungai Raya, Daerah Muar, 84300 Johor	Johor	No 891, Jln Kpg Juru, Juru,14000 Bukit Mertajam Pulau Pinang	25/10/2017	24/10/2038	0.18	Solar PV	Solar
57.	Tck Corporation Sdn. Bhd.	No Lot 15855 Mukim Pekan Lukut Daerah Port Dickson Negeri Sembilan	Negeri Sembilan	No 65, Jalan BP 5, Bandar Bukit Puchong 47100 Puchong Selangor	5/5/2017	4/5/2038	0.1728	Solar PV	Solar
58.	Tenaga Hilwanie Ariff Sdn. Bhd.	Sebahagian Lot PT 50, Mukim Bandar Kulim, Daerah Kulim, 09000 Kedah.	Kedah	No. 5 Ground Floor, Bangunan TH, Jalan Bersatu 13/04, 46200 Petaling Jaya Selangor	11/10/2017	10/10/2038	0.425	Solar PV	Solar
59.	Tiga Gajah Cho Heng Sdn. Bhd.	Sebahagian No. Lot 456, Mukim 12, Daerah Seberang Perai Selatan, 14200 Pulau Pinang	Pulau Pinang	6, Jalan Wawasan 1, Sungai Kapar Indah Industrial Park, 42200 Klang Selangor	27/10/2017	26/10/2038	0.425	Solar PV	Solar
60.	Tpi Industries Sdn. Bhd.	Sebahagian Lot 3627, Mukim Jasin, 77000 Jasin, Melaka	Melaka	E11-07 & E11-08, Capital 5, No.2 Jalan PJU 1a/7a, Oasis Square, Oasis Damansara, 47301 Petaling Jaya Selangor	22/8/2017	21/8/2038	0.1795	Solar PV	Solar

Bil. No.	Nama pemegang lesen *Licensee's name*	Alamat pepasangan *Installation address*	Negeri *State*	Alamat surat menyurat *Mailing address*	Tempoh sah lesen *License validity*		Kapasiti (MW) *Capacity (MW)*	Jenis loji *Plant type*	Sumber tenaga *Energy Source*
					Dari *From*	Hingga *Until*			
61.	Trident Cartel Sdn. Bhd.	Hutan Simpan Kekal Batu Talam, Mukim Sungai Liang, Daerah Raub, 27600 Pahang	Pahang	2-01, Pj Tower, Amcorp Trade Centre No. 18, Jalan Persiaran Barat 46050 Petaling Jaya Selangor	27/10/2017	26/10/2038	9.88	Hidro *Hydro*	Hidro *Hydro*
62.	U B Food Sdn. Bhd.	No Lot 182942, Mukim Pletong, Daerah Johor Bharu, 81750 Negeri Johor	Johor	No. 7 Jalan Sri Plentong 5 Taman Perindustrian Sri Plentong 81750 Masai Johor	15/8/2017	14/9/2038	0.18	Solar PV	Solar
63.	Velocity Construction Sdn. Bhd.	Lot 101877, Mukim Klang, Daerah Klang, 40400 Klang, Selangor	Selangor	No. 23-3, Jalan 8/146 Bandar Tasik Selatan 57000 Kuala Lumpur Wilayah Persekutuan	11/10/2017	10/10/2038	0.18	Solar PV	Solar
64.	Yee Lee Trading Co. Sdn. Bhd	Sebahagian Lot PT31095, Mukim Batu, Daerah Gombak 52200 Gombak	Selangor	46, Jalan Tago 2 Taman Perindustrian Tago Persiaran Industri Sri Damansara 52200 Kuala Lumpur Wilayah Persekutuan	29/11/2017	28/11/2038	0.42	Solar PV	Solar

Nota • *Notes:*
Semua pemegang lesen dalam jadual di atas mendapat kuota Feed-in Tariff (FiT), kecuali Perbadanan Memajukan Iktisad Negeri Terengganu (0.45 MW), Malaysian Green Technology Corporation (0.09 MW) dan Suria KLCC Sdn. Bhd. (0.68 MW)
All the licensees in the table above get a quota of Feed-inTariff (FiT), except Perbadanan Memajukan Iktisad Negeri Terengganu (0.45 MW), Malaysian Green Technology Corporation (0.09 MW) and Suria KLCC Sdn. Bhd. (0.68 MW)

Apendiks 15: Senarai pemegang lesen projek tenaga boleh baharu (TBB) di Sabah (lesen yang dikeluarkan pada 2017 dan aktif setakat 31 Disember 2017)

Appendix 15: List of renewable energy (RE) projects licencees in Sabah (licenses issued in 2017 and active as of 31 December 2017)

Bil. *No.*	**Nama pemegang lesen** *Licensee's name*	**Alamat pepasangan** *Installation address*	**Alamat surat menyurat** *Mailing address*	**Tempoh sah lesen** *License validity*		**Kapasiti (MW)** *Capacity (MW)*	**Jenis loji** *Plant type*	**Sumber tenaga** *Energy Source*
				Dari *From*	**Hingga** *Until*			
1.	Frontier Integrator (Sabah) Sdn. Bhd.	Sebahagian Lot NT063014719, Mukim Kg Nalapak, Daerah Ranau, 89300 Sabah.	Lot B616 & 617 Sixth Floor, Phase 2, Wisma Merdeka, 88000 Kota Kinabalu Sabah	18/1/2017	17/1/2038	1.0	Solar PV	Solar
2.	K.K. Letrik (Sabah) Sdn. Bhd.	Lot 015379549, Mukim Kota Kinabalu, Daerah Kota Kinabalu, 88450 Sabah.	No. 64, Ground Floor, Jalan Bandaran Berjaya, 88000 Kota Kinabalu Sabah	20/1/2017	19/1/2038	0.18	Solar PV	Solar
3.	Kudat Solar Synergy Sdn. Bhd.	Sebahagian Lot CL 055314853, Mukim Kudat, Daerah Kudat, 89058 Sabah.	Jeti Berkonsepkan Marina di Bandar Kudat, Off Jalan Urus Setia, 89058 Kudat Sabah	4/1/2017	3/1/2038	1.0	Solar PV	Solar
4.	LCS Energy Sdn. Bhd.	NT 033102957 Kg Tempasuk, 89150 Kota Belud, Sabah.	10, Jalan BPP 6/1, Taman Equine, 43300 Seri Kembangan Selangor	24/1/2017	23/1/2038	0.425	Solar PV	Solar
5.	Markmaju Corporation Sdn. Bhd.	Sebahagian Lot 13A (27), KM 5, Jalan Tuaran By Pass, 88450 Kota Kinabalu, Sabah	Unit No. 27, Neutron Riverside Lorong Kuala Neutron, Kuala Inanam 88450 Kota Kinabalu Sabah	11/10/2017	10/10/2038	0.33	Solar PV	Solar
6.	SI Standard Sdn. Bhd.	Sebahagian Lot NT 043141304 Kampong Penimbawan Daerah Tuaran, 89208 Sabah	Lot 32, 2nd Floor, Block E, Damai Plaza III, Luyang, 88300 Kota Kinabalu Sabah	6/1/2017	5/1/2038	1.0	Solar PV	Solar
7.	Sunleap Pursuit Sdn. Bhd.	Sebahagian CL 135316344 Kg. Labak 89007 Keningau Sabah	7, Lengkok Endau, Sri Tanjung Pinang, 10470 Tanjong Tokong Pulau Pinang	10/1/2017	9/1/2038	0.2285	Solar PV	Solar

Apendiks 16: Senarai pemegang lesen *cogeneration* awam dan persendirian di Semenanjung Malaysia (lesen yang sah setakat 31 Disember 2017)

Appendix 16: List of public and private cogeneration licenceesin Peninsular Malaysia (valid licenses as of 31 December 2017)

Bil. No.	**Nama pelesen dan lokasi pepasangan** *Licensee and installation location*	**Alamat perhubungan** *Address*	**Kapasiti dilesenkan (MW)** *Licensed capacity (MW)*	**Jenis lesen** *License type*	**Sumber tenaga** *Energy Source*
1.	**PERWAJA STEEL SDN. BHD.** Lot 1407, PT 2504 Kawasan Perindustrian Telok Kalong, 24007 Kemaman Terengganu.	Kawasan Perindustrian Telok Kalong P.O. Box 61 24007 Kemaman Terengganu.	9.50	Persendirian *Private*	Gas asli *Natural gas*
2.	**MALAYSIAN NEWSPRINT INDUSTRIES SDN. BHD**. Lot 3771, Jalan Lencongan Mentakab-Temerloh Temerloh Industrial Park 28400 Mentakab Pahang.	Lot 015379549, Mukim Kota Kinabalu, Daerah Kota Kinabalu, 88450 Sabah.	79.20	Persendirian *Private*	Medium Fuel Oil (MFO)
3.	**LOTTE CHEMICAL TITAN (M) SDN. BHD.** PLO 257, 312, 425 dan 426, Jalan Tembaga 4 Pasir Gudang Industrial Estate 81700 Pasir Gudang, Johor.	Sebahagian Lot CL 055314853, Mukim Kudat, Daerah Kudat, 89058 Sabah.	56.00	Persendirian *Private*	Gas asli *Natural gas*
4.	**LOTTE CHEMICAL TITAN (M) SDN. BHD.** PLO 8, Tanjung Langsat Industrial Park Mukim Sg. Tiram Johor Bahru Johor.	NT 033102957 Kg Tempasuk, 89150 Kota Belud, Sabah.	42.60	Persendirian *Private*	Gas asli *Natural gas*
5.	**CENTRAL SUGARS REFINERY SDN. BHD.** Batu Tiga 40150 Shah Alam Selangor.	Sebahagian Lot 13A (27), KM 5, Jalan Tuaran By Pass, 88450 Kota Kinabalu, Sabah	14.23	Persendirian *Private*	Gas asli *Natural gas*
6.	**BASF PETRONAS CHEMICALS SDN. BHD.** Lot 139, Kawasan Perindustrian Gebeng 26080 Kuantan Pahang.	Sebahagian Lot NT 043141304 Kampong Penimbawan Daerah Tuaran, 89208 Sabah	27.40	Persendirian *Private*	Gas asli *Natural gas*
7.	**GAS DISTRICT COOLING (PUTRAJAYA) SDN. BHD**. Plot 2U1 Putrajaya Precint 2 Wilayah Persekutuan Putrajaya.	Sebahagian CL 135316344 Kg. Labak 89007 Keningau Sabah	10.74	Persendirian *Private*	Gas asli *Natural gas*

Bil. No.	Nama pelesen dan lokasi pepasangan *Licensee and installation location*	Alamat perhubungan *Address*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Jenis lesen *License type*	Sumber tenaga *Energy Source*
8.	**GAS DISTRICT COOLING (PUTRAJAYA) SDN. BHD.** Plot 12371, Precint 1, WP Putrajaya, Lebuh Perdana Timur, Pusat Pentadbiran Kerajaan Persekutuan Putrajaya 62000 Putrajaya.	Mezzanine Floor, RISO Building Lot 2R1, Jalan P2X Precinct 2 62000 Putrajaya.	8.00	Persendirian *Private*	Gas asli *Natural gas*
9.	**MUDA PAPER MILLS SDN. BHD.** No. Lot 11207, Mukim Kajang Daerah Hulu Langat Selangor.	1 1/2 Miles Off Jalan Sungai Chua 43000 Kajang Selangor.	14.40	Persendirian *Private*	Gas asli *Natural gas*
10.	**LPETRONAS FERTILIZER (KEDAH) SDN. BHD.** Lot 10750, Bandar Gurun Daerah Kuala Muda Kedah.	KM 3, Jalan Jeniang P.O. Box 22 08300 Gurun Kedah.	18.31	Persendirian *Private*	Gas asli *Natural gas*
11.	**GULA PADANG TERAP SDN. BHD.** Lot 2143 dan 2142 Mukim Padang Terap Kiri, Daerah Padang Terap 06300 Kedah.	45 KM, Jalan Padang Sanai 06300 Kuala Nerang Kedah.	10.290	Persendirian *Private*	Gas asli *Natural gas*
12.	**MALAYAN SUGAR MANUFACTURING CO. BHD.** No. Lot 287 Mukim 1, Daerah Seberang Perai Tengah 13600 Perai Pulau Pinang.	No. 798 Main Road Prai 13600 Prai.	8.95	Persendirian *Private*	Gas asli *Natural gas*
13.	**PERAK-HANJOONG SIMEN SDN. BHD.** No. Lot 1076, 4059, 417, 1419, 1328, 1420, 1421, 1329, 1122, 1327, 1123, 1418, 1330, 1333 dan 1417 Mukim Kampung Buaya Daerah Kuala Kangsar 33700 Perak.	Yeoh Tiong Lay Plaza 6th Floor 55 Jalan Bukit Bintang 55100 Kuala Lumpur.	12.00	Persendirian *Private*	Haba buangan proses perindustrian *Industrial waste heat*
14.	**MALAYSIAN REFINING COMPANY SDN. BHD.** Petronas Penapisan Melaka Complex No. Lot 2332, Mukim Sungei Udang Melaka Tengah 76300 Melaka.	Bangunan Pentadbiran Persiaran Penapisan 76300 Sungai Udang Melaka	152.3	Persendirian *Private*	Gas asli *Natural gas*
15.	**PETRONAS GAS BERHAD** Gas Processing Plant - GPP A, Kertih Lot 1902, 1903 dan 3541, Mukim Kertih 24300 Daerah Kemaman Terengganu.	Loji Memproses Gas, KM 105 Jalan Kuantan/ Kuala Terengganu 24300 Kertih Kemaman Terengganu.	25.00	Persendirian *Private*	Gas asli *Natural gas*
16.	**PETRONAS GAS BERHAD** Gas Processing Plant - GPP B, Paka Lot 7346, Mukim Paka 23100 Daerah Dungun Terengganu.	Loji Memproses Gas, KM 105 Jalan Kuantan/ Kuala Terengganu 24300 Kertih Kemaman Terengganu.	25.00	Persendirian *Private*	Gas asli *Natural gas*

Bil. No.	Nama pelesen dan lokasi pepasangan *Licensee and installation location*	Alamat perhubungan *Address*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Jenis lesen *License type*	Sumber tenaga *Energy Source*
17.	**WRP ASIA PACIFIC SDN. BHD.** No. Lot PT 5758 dan PT 5759 Mukim Bandar Baru Salak Tinggi Daerah Sepang Selangor.	Lot 1, Jalan 3 Kawasan Perusahaan Bandar Baru salak Tinggi 43900 Sepang, Selangor	8.00	Persendirian *Private*	Gas asli *Natural gas*
18.	**ACIDCHEM INTERNATIONAL SDN. BHD.** Lot 4698, 5000 & 6241 Mukim 01 Seberang Perai Tengah Pulau Pinang.	2411, Lorong Perusahaan Satu Prai Industrial Complex 13600 Perai Pulau Pinang.	6.51	Persendirian *Private*	Gas asli *Natural gas*
19.	**KANEKA (MALAYSIA) SDN. BHD.** Lot PT 7469 Mukim Sungai Karang Daerah Kuantan Pahang.	Lot 123 - 124, Jalan Gebeng 2/3 Gebeng Industrial Estate 26080 Kuantan Pahang.	12.00	Persendirian *Private*	Gas asli *Natural gas*
20.	**KUALA LUMPUR KEPONG BERHAD** Kilang Kelapa Sawit Kekayaan Lot PT, Block 5 Mukim Paloh 86609 Kluang Johor.	Kilang Kelapa Sawit Kekayaan K/B No. 110 86609 Paloh Johor.	5.53	Persendirian *Private*	Biojisim (Gentian mesocarp dan tempurung kelapa sawit) *Biomass (Mesocarp fibre and shell from palm fruit)*
21.	**MSM PERLIS SDN. BHD.** Kilang MSM Perlis Sebahagian Lot 2039, Mukim Chuping Daerah Perlis 01700 Perlis.	P.O. Box 42 01700 Kangar Perlis.	9.39	Persendirian *Private*	Gas asli *Natural gas*
22.	**BIOVISION & GREENERGY SDN. BHD.** Sebahagian Lot 14205 (Lot Lama 1163) dan PT 5325 Mukim Pogoh Daerah Segamat 85000 Johor.	D-08-06, Block D , Level 8 Skypark @ One City Jalan USJ25/1A 47650 Subang Jaya Selangor.	6.88	Persendirian *Private*	Biomas (EFB) dan disel *Biomass(EFB) & diesel*
23.	**KL-KEPONG OLEOMAS SDN. BHD.** Sebahagian Lot 161987 Mukim Klang, Daerah Klang 42920 Selangor.	No. 25, Jalan Sungai Pinang 5/18 Fasa 2D, Taman Perindustrian Pulau Indah 42920 Klang Selangor	6.5	Persendirian *Private*	Gas asli *Natural gas*
24.	**GAS DISTRICT COOLING (KLIA) SDN. BHD**. Kuala Lumpur International Airport Daerah Sepan Selangor.	Jalan KLIAS5 (KLIA Selatan), Southern Support Zone 64000 KLIA, Sepang Sepang Selangor.	60.00	Awam *Public*	Gas asli *Natural gas*
25.	**SEE SEN CHEMICAL BHD**. Malay-Sino Chermical Industries Sdn. Bhd. Lot 2989, 3558, 3557 dan 4525 Mukim Teluk Kalong Daerah Kemaman Terengganu.	PT 3940, Kawasan Perindustrian Teluk Kalong 24000 Kemaman Terengganu	8.00	Awam *Public*	Haba buangan proses perindustrian *Industrial waste heat*

Bil. No.	Nama pelesen dan lokasi pepasangan *Licensee and installation location*	Alamat perhubungan *Address*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Jenis lesen *License type*	Sumber tenaga *Energy Source*
26.	**PETRONAS GAS BERHAD** Petrochemical Complex Kerteh Industrial Area Terengganu.	Centralised Utility Facilities (CUF), Integrated Petrochemical Complex, KM 106 Jln. Kuantan/K. Terengganu 24300 Kertih, Kemaman, Terengganu	210.00	Awam *Public*	Gas asli *Natural gas*
27.	**PETRONAS GAS BERHAD** Petrochemical Complex Gebeng Industrial Area Kuantan, Pahang.	Centralised Utility Facilities (CUF), Integrated Petrochemical Complex, Lot 139A Gebeng Industrial Area, Phase III 26080 Kuantan, Pahang.	105.00	Awam *Public*	Gas asli *Natural gas*
28.	**INSTITUTE OF TECHNOLOGY PETRONAS SDN. BHD**. Kampus Universiti Teknologi Petronas, Tronoh Perak.	Bandar Seri Iskandar 31750 Tronoh Perak.	8.40	Awam *Public*	Gas asli *Natural gas*
29.	**PERSTIMA UTILITY SDN. BHD.** Perstima Berhad, No. Lot 00051694 Mukim Plentong Daerah Johor Bahru, Johor.	PO Box 26, PLO 255 Jalan Timah 3 Kawasan Perindustrian Pasir Gudang 81700 Pasir Gudang Johor.	5.67	Awam *Public*	Gas asli *Natural gas*
30.	**OPTIMISTIC ORGANIC SDN. BHD.** Plot No. 4248 Telok Kalong Industries Estate 24007 Kemaman Terengganu.	Lot 3351 Teluk Kalong Industrial Estate 24007 Kemaman Terengganu.	7.000	Awam *Public*	Haba buangan proses perindustrian *Industrial waste heat*
31.	**GAS MALAYSIA ENERGY ADVANCE SDN. BHD**. Kawasan Kompleks Perindustrian Toray Lot PT 2812, Mukim 01 Daerah Seberang Perai Tengah Pulau Pinang.	IPAC2, No. 42 Jalan Serendah 26/339 Seksyen 26 40400 Shah Alam Selangor.	33.50	Awam *Public*	Gas asli *Natural gas*
32.	**HENGYUAN REFINING COMPANY BERHAD** Batu 1, Jalan Pantai 71000 Port Dickson Negeri Sembilan.	Kompleks Hengyuan Refining Company Berhad Port Dickson 71000 Negeri Sembilan	35.00	Awam *Public*	Gas asli *Natural gas*
33.	**GAS MALAYSIA ENERGY ADVANCE SDN. BHD**. Panasonic Appliances Air-Conditioning Malaysia Sdn. Bhd., Lot PT 3, Seksyen 21 Mukim Bandar Shah Alam Daerah Petaling Selangor.	IPAC2, No. 42 Jalan Serendah 26/339 Seksyen 26 40400 Shah Alam Selangor.	2.055	Awam *Public*	Gas asli *Natural gas*

Apendiks 17: Senarai pemegang lesen cogeneration awam dan persendirian di Sabah (lesen yang sah setakat 31 Disember 2017)
Appendix 17: List of public and private cogeneration licencees in Sabah (valid licenses as of 31 December 2017)

Bil. *No.*	**Nama pelesen dan lokasi pepasangan** *Licensee and installation location*	**Alamat perhubungan** *Address*	**Kapasiti dilesenkan (MW)** *Licensed capacity (MW)*	**Jenis lesen** *License type*	**Sumber tenaga** *Energy Source*
1.	**FELDA PALM INDUSTRIES SDN. BHD.** Gugusan Felda Sahabat Mukim Tungku Daerah Lahad Datu Sabah.	Loji Janakuasa Biomass Sahabat Peti Surat 246, Cenderawasih 91150 Lahad Datu Sabah.	7.50	Persendirian *Private*	Biojisim (EFB) *Biomass (EFB)*
2.	**EKSONS BIOMASS ENERGY SDN. BHD.** Rajang Plywood (Sabah) Sdn. Bhd. CLS 105486762, 105486771 dan PT2000100538, Sg. Umas, Umas Mukim Merotai, Tawau Sabah.	TB 4327 Block 31, 2nd Floor Fajar Complex, Jalan Haji Karim 91000 Tawau Sabah.	3.00	Awam *Public*	Biojisim(sisa kayu) *Biomass (wood waste*
3.	**EVERGREEN INTERMERGE SDN. BHD.** Cacao Paramount Sdn. Bhd. Lot Cl 105323797 KM 3, Tanjung Batu Laut Tawau Sabah.	318, Teck Guan Regency, Jalan St Patrick, Off Jalan Belunu P.O. Box No. 33 , 91007 Tawau Sabah.	6.00	Awam *Public*	Biojisim (EFB) *Biomass (EFB)*
4.	**SEO ENERGY SDN. BHD.** Sandakan Edible Oils Sdn. Bhd. KM 8, Jalan Batu Sapi Karamunting, Sandakan Sabah.	Km 8, Jalan Batu Sapi Karamunting P.O. Box 2605 90729 Sandakan Sabah.	1.20	Awam *Public*	Biojisim (EFB) *Biomass (EFB)*
5.	**PETRONAS METHANOL (LABUAN) SDN. BHD.** Kawasan Perindustrian Ranca-Ranca Labuan, 87010 Wilayah Persekutuan Labuan Sabah.	Kawasan Perindustrian Ranca-Ranca Peti Surat No. 80079 87010 W.P. Labuan.	41.80	Awam *Public*	Gas asli *Natural gas*
6.	**UNTUNG RIA SDN. BHD.** Lot No. CL 135193752 dan CL 135366139 Kg. Ulu Patikang Daerah Keningau, Sabah.	11th Floor, Wisma Perindustrian Jalan Istiadat, Likas 88400 Kota Kinabalu Sabah.	4.000	Awam *Public*	Biojisim(sisa kayu) *Biomass (wood waste*
7.	**IOI BIO-ENERGY SDN. BHD.** IOI Edible Oils Sdn. Bhd. IOI Integrated Edible Oil Processing Complex, Mukim Sungai Mowtas, Daerah Sandakan, 90738 Sabah.	Two IOI Square IOI Resort 62502 Putrajaya.	15.00	Awam *Public*	Biojisim (EFB) *Biomass (EFB)*

Bil. No.	Nama pelesen dan lokasi pepasangan *Licensee and installation location*	Alamat perhubungan *Address*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Jenis lesen *License type*	Sumber tenaga *Energy Source*
8.	**PETRONAS CHEMICALS FERTILIZER SABAH SDN. BHD.** No. Lot PT2010191348, Mukim Mengalong Daerah Sipitang 89850 Sabah.	Tower 1, Petronas Twin Towers Kuala Lumpur City Centre 50088 Kuala Lumpur.	65.00	Persendirian *Private*	Gas asli *Natural gas*

Nota • *Notes:*
EFB: Tandan sawit kosong *Empty fruit bunches*

Apendiks 18: Penjana kuasa menggunakan sumber tenaga yang boleh diperbaharui (Solar berskala besar, LSS)
Appendix 18: Power Generator Using Renewable Energy Resources (Large-scale Solar, LSS)

Bil. No.	Nama Pelesen dan lokasi *Licensee and location*	Alamat perhubungan *Address*	Jenis loji *Plant type*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*
1.	**TADAU ENERGY SDN. BHD.** CL 055322953 & CL 055025824 89050 Kudat Sabah.	No. 36, Jalan Batai Barat, Bukit Damansara, 50490 Wilayah Persekutuan Kuala Lumpur.	Solar PV	2.352	Solar	07-06-2017
2.	**IL SOLAR SDN. BHD.** 560-563, Lot 2011, Bandar Bukit Kayu Hitam, Kubang Pasu, 06059 Kedah.	Indera Subang Jaya Jalan USJ 6/2L, UEP Subang Jaya, 47610 Subang Jaya Selangor.	Solar PV	12.0	Solar	24-08-2017
3.	**EASTERN PACIFIC GD SOLAR SDN. BHD.** PN 8183, No. Lot 6217, Mukim Teluk Kalung, Daerah Kemaman 24000 Terengganu.	Wisma MIE, No. 2, Jalan Industri PBP 2, Taman Industri Pusat Bandar Puchong, 47160 Puchong, Selangor.	Solar PV	23.055	Solar	03-10-2017
4.	**TESDEC GREEN ENERGY SDN. BHD.** Lot 9902, Mukim Sura, 23000 Dungun Terengganu.	Kampus Induk, Kawasan Perindustrian Bukit Khor, 21600 Marang, Terengganu.	Solar PV	4.28	Solar	27-10-2017

Apendiks 19: Penjana kuasa menggunakan sumber tenaga yang boleh diperbaharui (Net energy metering, NEM)
Appendix 19: Power generator using renewable energy resources (Net energy metering, NEM)

Bil. No.	Nama Pelesen dan lokasi *Licensee and location*	Alamat perhubungan *Address*	Jenis loji *Plant type*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*
1.	**BECKER INDUSTRIAL COATINGS (M) SDN. BHD.** 118480 Klang Klang, 40460 Selangor.	No. 3 & 5 Jalan Anggerik Mokara 31/54, Kota Kemuning 40460 Shah Alam, Selangor	Solar PV	0.1	Solar	03-08-2017
2.	**AIDENT CORPORATION SDN. BHD. (NEM)** 4565 Mukim13 Seberang Perai Tengah 14000 Pulau Pinang.	790, Jalan Perindustrian Bukit Minyak 4, Kawasan Perindustrian Bukit Minyak, 14000 Bukit Mertajam	Solar PV	0.20	Solar	08-08-2017
3.	**KUMPULAN IKRAM SDN. BHD**. 52518 Bandar Baru Bangi 43000 Sepang Selangor.	2nd Floor, Corporate Block Unipark Suria Jalan Ikram-Uniten 43000 Kajang Selangor.	Solar PV	0.185	Solar	15-08-2017

Apendiks 20: Lesen persendirian berkapasiti 5 MW dan ke atas
Appendix 20: Private license with capacity of 5 MW and above

Bil. No.	Nama Pelesen dan lokasi *Licensee and location*	Alamat perhubungan *Address*	Jenis *Type*	Sumber tenaga *Energy source*	Kapasiti (MW) *Capacity (MW)*
1.	**NAM BEE COMPANY SDN. BHD.** Lot 548, Mukim Ayer Kuning Selatan Daerah Tampin 73200 Negeri Sembilan.	(Palm Oil Mill Division) Air Kuning Selatan 73200 Gemencheh Negeri Sembilan.	Turbin stim *Steam turbine*	Sisa sawit *Palm oil waste*	9.02
2.	**TAMACO OIL MILL SDN. BHD.** No. Lot 115413413 dan 115413404 Mukim Kinabatangan Negeri Sabah.	Mill 2, Lot 5-8, Kimbell Light Industrial Centre Mile 2, Jalan Dam, P.O. Box 61625 91124 Lahad Datu, Sabah.	Turbin stim *Steam turbine*	Sisa sawit *Palm oil waste*	11.08
3.	**ROMPIN PALM OIL MILL SDN. BHD.** Lot HS(D)1942 Mukim Bebar, Pekan Pahang.	P.O. Box 58 Muadzam Shah 26700 Pahang.	Turbin stim *Steam turbine*	Sisa sawit *Palm oil waste*	5.66

Bil. No.	Nama Pelesen dan lokasi *Licensee and location*	Alamat perhubungan *Address*	Jenis *Type*	Sumber tenaga *Energy source*	Kapasiti (MW) *Capacity (MW)*
4.	**PETRONAS CARIGALI SDN. BHD.** No. Lot 023113608, 023113617, CL.25340489, 021250047, 023141212, 02126177 @PT.91021739, 025373540, LA.2009220181 dan JTSB-1989-LA01G Mukim Kimanis, Papar 89608 Sabah.	Tower 1, Menara Berkembar Petronas Kuala Lumpur City Centre 50088 Wilayah Persekutuan Kuala Lumpur.	Turbin gas (kitar terbuka) *Gas turbine (open cycle)*	Sisa sawit *Palm oil waste*	52.48
5.	**FELDA VEGETABLES OIL PRODUCTS SDN. BHD.** Kilang Sahabat Oil Products Kompleks Bandar Sahabat 91150 Lahad Datu Sabah.	Sahabat Oil Products Peti Surat No. 150 91150 Lahad Datu Sabah.	Enjin diesel *Diesel engine*	Diesel	5.45
6.	**KIM LOONG POWER SDN. BHD.** No. Lot CL095332648 Mukim Entilibon Daerah Tongod 90707 Sandakan, Sabah.	No. A042, Pekan Telupid Peti Surat No. 27 89300 Telupid Sabah.	Turbin stim *Steam turbine*	Sisa sawit *Palm oil waste*	5.08
7.	**TAMACO OIL MILL (1) SDN. BHD.** Lot CL115360891 91124 Daerah Lahad Datu Sabah.	Lot 7, Kimbell Light Industrial Centre Mile 2, Jalan Dam P.O. Box 61625, 91124 Lahad Datu, Sabah.	Enjin diesel *Diesel engine*	Biojisim, diesel *Biomass, diesel*	6.96
8.	**KILANG SAWIT C.P.SDN. BHD.** Sebahagian Lot PT 2136 Mukim Perak Daerah Temerloh 28000 Pahang.	Charuk Putting Palm Oil Mill 28000 Temerloh Pahang.	Turbin stim *Steam turbine*	EFB, diesel	5.64
9.	**LIZIZ PLANTATION SDN. BHD.** Lot PT 5893 Mukim Ulu Nenggiri Daerah Jajahan Gua Musang Kelantan.	Kilang Sawit Liziz Ladang Kuala Betis 18300 Gua Musang Kelantan.	Turbin stim *Steam turbine*	Fiber mesocarp daripada buah sawit, diesel *Mesocarp fibre from palm fruit, diesel*	5.85
10.	**LADANG SABAH SDN. BHD.** Ladang Sabah Palm Oil Lot W.D.T. No 164 Mukim Beluran Daerah Sandakan Sabah.	IOI Sandakan Reg Office W.D.T. 164 90009 Sandakan Sabah	Turbin stim *Steam turbine*	Gas, Diesel, (EFB, POME)	7.79
11.	**MAHAMURNI PLANTATIONS SDN. BHD.** Sebahagian Lot 721, Mukim Sedenak Daerah Johor Bahru 80990 Johor.	Sedenak Palm Oil Mill K.B. No. 721 80990 Johor Bahru Johor	Turbin stim *Steam turbine*	Diesel, gas, biogas (Sisa kilang minyak sawit) *(palm oil mill waste)*	6.5
12.	**ASIA OIL PALM SDN. BHD.** Ladang Asia Palm Oil, Lot Cl 095317383, Mukim Kinabatangan Daerah Lahad Datu 81100 Sabah.	Unit 30-02, Mail Box 288 Menara Landmark, No. 12 Jalan Ngee Heng , 80000 Johor Bahru Johor.	Turbin stim *Steam turbine*	POME	6.3

Bil. *No.*	Nama Pelesen dan lokasi *Licensee and location*	Alamat perhubungan *Address*	Jenis *Type*	Sumber tenaga *Energy source*	Kapasiti (MW) *Capacity (MW)*
13.	**KILANG SAWIT MUAR BERHAD** Sebahagian Lot 2743 Mukim Parit Jawa Daerah Muar 84150 Johor.	Jalan Bukit Mor Mukin Parit Jawa 84009 Muar Johor	Turbin stim *Steam turbine*	EFB, Diesel	6.39
14.	**COMPASS GROUP MALAYSIA** No. Lot 1742, Mukim Pengerang Daerah Kota Tinggi, 81900 Johor.	25.03A, Level 25, Johor Bahru City Square Office Tower, 106-108 Jalan Wong Ah Fook 80000 Johor Bahru, Johor.	Enjin diesel *Diesel engine*	Diesel	12.043
15.	**SRI SENGGORA KILANG KELAPA SAWIT SDN. BHD.** Sebahagian Lot PT 6108 Mukim Luit, Daerah Maran 26500 Pahang.	PT 6108 Jalan Kampong Belimbing 26500 Maran Pahang.	Enjin diesel *Diesel engine*	EFB	8.23
16	**KL-KEPONG (SABAH) SDN. BHD.** No. Lot CL 105387719 Mukim Kalumpang Daerah Tawau, 91009 Sabah.	Mile 42, Jalan Tawau-Semporna Locked Bag No. 3 91009 Tawau Sabah.	Enjin gas *Gas engine*	Sisa kilang minyak sawit *Palm oil mill waste*	8.8
17.	**MELEWAR PROPERTIES SDN. BHD**. Melewar Palm Oil Mill, Sebahagian Lot 095310400, Daerah Kinabatangan 91109 Sabah.	Melewar Palm Oil Mill Locked Bag No. 11 91109 Lahad Datu Sabah.	Turbin stim *Steam turbine*	Biogas, Gas, Diesel	8.758
18.	**GLOBAL ENTERPRISE OIL MILL SDN. BHD**. Kilang Global Enterprise Oil Mill Sdn. Bhd., KM 79, Lahad Datu - Sandakan Highway Mukim Sg. Pin Supu Daerah Kota Kinabatangan, Sabah.	Lot 4-7, MDLD 6014-6017 1st Floor, Global Commercial Building Mile 1, Jalan Tengah Nipah 91100 Lahad Datu Sabah.	Turbin stim *Steam turbine*	Diesel	7.806
19.	**IKANO COCHRANE SDN. BHD**. No. Lot PT 478, Mukim Seksyen 90, Daerah Bandar Kuala Lumpur, 55100 Wilayah Persekutuan.	No. 2, Jalan PJU 7/2, Mutiara Damansara 47800 Petaling Jaya Selangor.	Solar PV	Solar	1.35

Nota • *Notes:*
POME: Efluen kilang kelapa sawit *Palm oil mill effluent*
EFB: Tandan sawit kosong *Empty fruit bunches*

Apendiks 21: Senarai pengagih elektrik di Semenanjung Malaysia (lesen dikeluarkan pada tahun 2017 sahaja)
Appendix 21: List of electricity distributors in Peninsular Malaysia (licenses issued in year 2017 only)

Bil. No.	**Nama pelesen dan alamat perhubungan** *Licencee and address*	**Kawasan bekalan** *Area of supply*	**Kapasiti dilesenkan (MW)** *Licensed capacity (MW)*	**Tarikh lesen dikeluarkan** *Date of license issuance*
1.	**GENTING UTILITIES & SERVICES SDN. BHD.** Tingkat 24, Wisma Genting 28 Jalan Sultan Ismail 50250 Kuala Lumpur.	Genting Highlands Resort Pahang.	230.00	27-12-2017
2.	**MALAKOFF UTILITIES SDN. BHD.** Suite 4-G-A, Ground Floor, Block 4 Plaza Sentral, Jalan Stesen Sentral 5, 50470 Kuala Lumpur.	Kawasan Pembangunan Kuala Lumpur Sentral 74 Jalan Tun Sambanthan Brickfields, 50470 Wilayah Persekutuan	153.00	03-10-2017
3.	**LEMBAGA TABUNG HAJI** Tingkat 7, Bangunan TH Perdana 1001, Jalan Sultan Ismail 50250 Kuala Lumpur.	Menara TH Perdana Lot 1752 Seksyen 46 Bandar Kuala Lumpur 50250 Wilayah Persekutuan Kuala Lumpur.	5.95	01-03-2017
4.	**ENG LIAN ENTERPRISE SDN. BHD.** 9 Jalan Ampang #05-00, 50450 Kuala Lumpur.	Bangsar Village II, Lot 43872, 43873 dan 43874, Mukim Kuala Lumpur, Daerah Kuala Lumpur	3.400	03-10-2017
5.	**TERRA MIRUS SDN. BHD.** No. 71-M, Jalan Setiabakti Bukit Damansara 50490 Wilayah Persekutuan Kuala Lumpur.	Kompleks Pinnacle PJ Lot 10113 Seksyen 27 Mukim Bandar Petaling Jaya Daerah Petaling	11.90	09-01-2017
6.	**KLCC URUSHARTA SDN. BHD.** Level 33 & 34 Menara Dayabumi, Kompleks Dayabumi Jalan Sultan Hishamuddin P.O. Box 13214 50050 Kuala Lumpur.	Menara 1 dan Menara 2Menara Berkembar Petronas Lot 169, Seksyen 58 Bandar Kuala Lumpur Daerah Kuala Lumpur 50088 Wilayah Persekutuan Kuala Lumpur.	15.64	20-01-2017
7.	**SUNWAY SOUTH QUAY SDN. BHD.** Level 3, Menara Sunway Jalan Lagoon Timur Bandar Sunway 48500 Petaling Jaya Selangor.	Lot 62638 Jalan PJS 9/6 Bandar Sunway Mukim Damansara Daerah Petaling 46200 Selangor	3.40	20-01-2017
8.	**PELABURAN HARTANAH BERHAD** Level 9, Block D Peremba Square Saujana Resort, Section U2, 40150 Shah Alam Selangor.	Quill Q8 Cyberjaya Sebahagian Lot PT 12062, Mukim Dengkil Daerah Sepang, 63000 Selangor.	5.95	24-01-2017

Bil. *No.*	Nama pelesen dan alamat perhubungan *Licencee and address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen dikeluarkan *Date of license issuance*
9.	**DC OFFICES SDN. BHD.** Level 19, Block B, HP Towers, 12 Jalan Gelenggang Bukit Damansara 50490 Kuala Lumpur.	Damansara City Complex (Tower B) Sebahagian Lot 58303 Mukim Kuala Lumpur Daerah Kuala Lumpur, 50490 Wilayah Persekutuan Kuala Lumpur	4.76	27-02-2017
10.	**DC PARKING SDN. BHD.** Level 19, Block B, HP Towers, 12 Jalan Gelenggang Bukit Damansara 50490 Kuala Lumpur.	Damansara City Complex Sebahagian Lot 5830350490 Wilayah Persekutuan Kuala Lumpur.	5.95	27-02-2017
11.	**DC TOWER SDN. BHD.** Level 19, Block B, HP Towers 12 Jalan Gelenggang Bukit Damansara 50490 Kuala Lumpur.	Damansara City Complex (Tower A) Sebahagian Lot 58303 Mukim Kuala Lumpur Daerah Kuala Lumpur 50490 Wilayah Persekutuan Kuala Lumpur.	9.52	27-02-2017
12.	**DC TOWN SQUARE SDN. BHD.** Level 19, Block B, HP Towers 12 Jalan Gelenggang Bukit Damansara, 50490 Kuala Lumpur.	Lot 7, Kimbell Light Industrial Centre Mile 2, Jalan Dam P.O. Box 61625, 91124 Lahad Datu, Sabah.	8.33	27-02-2017
13.	**CONSISTENT HARVEST SDN. BHD.** Level 8, Tower 7, Avenue 5 The Horizon Bangsar South Jalan Kerinchi 59200 Kuala Lumpur.	Seremban Centre Point Complex Lot 23661 & 23661 Mukim Bandar Seremban Daerah Seremban 70100 Negeri Sembilan	4.76	07-03-2017
14.	**SL LAND SDN. BHD.** D-6-03&3A, Level 6, Block D, Skypark@One City, Jalan USJ 25/1 47600 Subang Jaya Selangor.	Bazaar Central Complex, Lot 60576, 60577 & 60581, Mukim Bandar Nilai Utama, Daerah Seremban 71800 Negeri Sembilan.	7.23	07-03-2017
15.	**WINNING PARAMOUNT SDN. BHD.** Suite 12.05, Level 12, Centrepoint North Tower Mid Valley City Lingkaran Syed Putra 59200 Kuala Lumpur.	Lot 3 Seksyen 22 (PN 89971) Mukim Bandar Shah Alam Daerah Petaling 40000 Selangor.	6.80	07-03-2017
16.	**PEARL DISCOVERY DEVELOPMENT SDN. BHD.** Suite 17-11, Wisma UOA 11 No. 21, Jalan Pinang 50450 Kuala Lumpur.	Kompleks Puteri Cove Residence & Quayside Lot PTD 166945 Mukim Pulai Daerah Johor Bahru	15.70	14-03-2017
17.	**SUNWAY PKNS SDN. BHD.** Sunway Nexis Jalan PJU 5/1 Kota Damansara 47810 Petaling Jaya Selangor.	Kompleks Sunway Nexis Sebahagian Lot 65670 Mukim Petaling Daerah Petaling 47180 Selangor	*9.10*	16-03-2017

Bil. No.	Nama pelesen dan alamat perhubungan *Licencee and address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen dikeluarkan *Date of license issuance*
18.	**ONE JSI DEVELOPMENT SDN. BHD.** Blok Menara, Kompleks Pertama Jalan Tuanku Abdul Rahman Peti Surat 10080 50100 Kuala Lumpur.	One JSI Residence Building Lot 3347 & 3348, Bandar Kuala Lumpur Daerah Kuala Lumpur 50100 Wilayah Persekutuan Kuala Lumpur.	3.40	20-03-2017
19.	**TSR OCEAN PARK SDN. BHD.** Level 16, Menara TSR Jalan PJU 7/3 Mutiara Damansara 47810 Petaling Jaya, Selangor.	Wharf Residence Service Apartment Building D'Sebahagian Lot PT 824 Mukim Bandar Port Dickson 71000 Negeri Sembilan.	5.10	23-05-2017
20.	**NICE FRONTIER SDN. BHD.** No. 1, Lebuh Putra Utama Bandar Utama 81000 Kulai Johor.	PTD 99023 Mukim Senai Daerah Kulaijaya 81000 Johor.	8.50	30-05-2017
21.	**PLATINUM WHOLESALES CITY SDN. BHD.** Lot 1441, Taman Koperatif Jalan Wakaf Mek Zainab 15300 Kota Bharu Kelantan.	Platinum Wholesales City Mall PT 1885 Seksyen 17 Mukim Bandar Kota Bharu Daerah Jajahan Kota Bharu 15150 Kelantan.	8.50	30-05-2017
22.	P**KNS-ANDAMAN DEVELOPMENT SDN. BHD.** No. 19, USJ Sentral Jalan USJ Sentral 3 Persiaran Subang 47600 Subang Jaya Selangor.	Bangi Evo Complex, No Lot PT 68975 (No. H.S.(D): 132210) Mukim Bandar Baru Bangi Daerah Ulu Langat Selangor.	11.22	08-06-2017
23.	**MAXWELL ASSETS SDN. BHD.** Taylor's Lakeside Campus Level 5., Block A No. 1, Jalan Taylor's 47500 Subang Jaya Selangor.	Taylor's University Hostel sebahagian Lot 64683, Mukim Pekan Penaga Daerah Petaling,47500 Selangor.	4.42	21-06-2017
24.	**OVERSEAS UNION GARDEN SDN. BHD.** 50 Jalan Awan Hijau Taman Overseas Union 58200 Kuala Lumpur.	Bangunan `OUG Market' Sebahagian Lot 9544 Mukim Petaling Daerah Kuala Lumpur	0.807	03-07-2017
25.	**ASAL HARTA SDN. BHD.** No. 8 & 10, Tingkat Bawah Jalan Mutiara Melaka 2 Taman Mutiara Melaka75350 Batu Berendam Melaka.	Sebahagian Lot 2307 Mukim Kawasan Bandar IV Daerah Melaka Tengah 75561 Melaka.	4.25	10-07-2017
26.	**AEON CO. (M) BHD.** Jusco Taman Maluri Shopping Centre, 1st. Floor Jalan Jejaka, Taman Maluri Cheras 55100 Kuala Lumpur.	AEON Mall Bandar Dato' Onn Sebahagian Lot PTD 181046 Mukim Tebrau, Daerah Johor Bharu 81100 Johor.	*17.00*	12-07-2017

Bil. No.	Nama pelesen dan alamat perhubungan *Licencee and address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen dikeluarkan *Date of license issuance*
27.	**PLAZA 33 SDN. BHD.** Plaza 33, No. 1 Jalan Kemajuan, Seksyen 13 46200 Selangor.	Menara Prudential Sebahagian Lot 1306, Seksyen 57 Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur	2.72	08-08-2017
28.	**FIC INTEGRATED PROPERTY MANAGEMENT SDN. BHD.** Tingkat 02, Balai Felda Jalan Gurney 01 54000 Kuala Lumpur.	Gugusan Felda Sahabat (Kampung Cenderawasih Dan Kampung Desa Kencana) Felda Umas dan Felda Kalabakan (Kalabakan Tengah 1 dan Kalabakan Tengah 2)	9.68	08-09-2017
29.	**FUYUU GROUP SDN. BHD.** F3-96, Hatten Square Jalan Merdeka 75000 Bandar Hilir Melaka.	Vedro Mall Sebahagian Lot 427Daerah Melaka Tengah Mukim Kawasan Bandar XIX 75000 Melaka.	2.72	25-09-2017
30.	**PRPC UTILITIES AND FACILITIES SDN. BHD.** Level 59, Vista Tower, The Intermark, 348, Jalan Tun Razak 50400 Wilayah Persekutuan Kuala Lumpur.	Pengerang Integrated Complex Mukim Pengerang, Daerah Kota Tinggi 81600 Johor.	786.0	28-09-2017
31.	**MEDINI DEVELOPMENT SDN. BHD.** B-FF-02, Medini 6 Jalan Medini Sentral 5 Bandar Medini Iskandar 79250 Johor Bahru Johor.	Medini 9, Lot PTD 187624 Mukim Pulai Daerah Johor Bharu 79250 Johor.	10.20	03-10-2017
32.	**UOA DEVELOPMENT BERHAD** UOA Corporate Tower Lobby A, Avenue 10, The Vertical Bangsar South City No. 8, Jalan Kerinchi 59200 Wilayah Persekutuan Kuala Lumpur.	Nexus Bangsar South Complex Sebahagian Lot 58191, Mukim Kuala Lumpur Daerah Kuala Lumpur 59200 Wilayah Persekutuan Kuala Lumpur	4.25	03-10-2017
33.	**HENGYUAN REFINING COMPANY BERHAD** Batu 1, Jalan Pantai 71000 Port Dickson Negeri Sembilan.	Kompleks Hengyuan Refining Company Berhad Port Dickson 71000 Negeri Sembilan.	35.00	03-10-2017
34.	**PERAK E-ORGANIZATION SDN. BHD.** Level 8, Perak Techno Trade Centre Bandar Meru Raya Off Jalanb Jelapang 30020 Ipoh, Perak.	Lot PT 228331 Mukim Hulu Kinta Daerah Kinta 30020 Perak.	3.4	16-10-2017
35.	**MYDIN WHOLESALE CASH AND CARRY SDN. BHD.** Lot 675 & 676 Persiaran Permai, USJ 1 47500 Subang Jaya Selangor.	Mydin Mall Bukit Mertajam Sebahagian Lot 10413, Mukim 06 Daerah Seberang Perai Tengah 14100 Pula Pinang.	*13.175*	27-10-2017

Bil. No.	Nama pelesen dan alamat perhubungan *Licencee and address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen dikeluarkan *Date of license issuance*
36.	**GAS MALAYSIA ENERGY ADVANCE SDN. BHD.** IPAC2, No. 42 Jalan Serendah 26/339, Seksyen 26 40400 Shah Alam Selangor.	Panasonic Appliances Air-conditioning Malaysia Sdn. Bhd. Lot PT 3, Seksyen 21 Mukim Bandar Shah Alam Daerah Petaling Selangor.	2.06	15-11-2017
37.	**GCH RETAIL (MALAYSIA) SDN. BHD.** Giant Hypermarket Shah Alam, Lot 2 Persiaran Sukan, Seksyen 13 40100 Shah Alam Selangor.	Kompleks Giant Superstore Kuala Selangor Sebahagian Lot 619 & 620 Mukim Kuala Selangor Daerah Kuala Selangor 45000 Selangor.	1.70	11-12-2017

Apendiks 22: Senarai pengagih elektrik di Sabah (lesen dikeluarkan pada tahun 2017 sahaja)
Appendix 22: List of electricity distributors in Sabah (licenses issued in year 2017 only)

Bil. No.	Nama pelesen dan alamat perhubungan *Licencee and address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen dikeluarkan *Date of license issuance*
1.	**ASIAN SUPPLY BASE SDN. BHD.** Ranca-Ranca Industrial Estate P.O. Box 80751, 87017 Labuan Federal Territory Sabah.	Asian Supply Base Lot 206291581, Ranca-Ranca Industrial Estate Wilayah Persekutuan Labuan Sabah.	16.05	16-03-2017
2.	**SABANILAM ENTERPRISE SDN. BHD.** 1st Floor, Lot 6 & 7, Block M Donggongon New Township Penampang P.O. Box 14074, 88847 Kota Kinabalu, Sabah.	ITCC Penampang Kompleks Mukim Jalan Pintas Daerah Penampang Sabah.	16.50	22-08-2017

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