Suruhanjaya Tenaga
Energy Commission

2016

MAKLUMAT PRESTASI DAN STATISTIK INDUSTRI PEMBEKALAN ELEKTRIK DI MALAYSIA

PERFORMANCE AND STATISTICAL INFORMATION ON ELECTRICITY SUPPLY INDUSTRY IN MALAYSIA

Suruhanjaya Tenaga
Energy Commission

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Tel: (03) 8870 8500 Faks • *Fax:* (03) 8888 8637
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Executive Summary

SITUASI PEMBEKALAN DAN PERMINTAAN TENAGA ELEKTRIK

Pada tahun 2016, jumlah kapasiti terpasang bagi stesen-stesen jana kuasa utama Semenanjung Malaysia telah meningkat kepada 22,910.50 MW daripada 20,710 MW pada tahun 2015. Kapasiti terpasang ini telah bertambah dengan beroperasinya stesen jana kuasa baharu seperti TNB Connaught Bridge, Tanjung Bin Energy, TNB Prai, Ulu Jelai dan Tembat. Fenomena El Nino yang melanda negara juga telah menyebabkan peningkatan sebanyak 5.7% pada kehendak maksimum yang dicatatkan pada 20 April 2016 iaitu 17,788 MW.

Penjanaan elektrik oleh stesen-stesen jana kuasa utama juga turut meningkat kepada 121,688.47 GWj dengan penjanaan tertinggi sebanyak 372.5 GWj yang dicatatkan pada 20 April 2016. Dari segi bahan api, arang batu masih lagi mendominasi campuran penjanaan elektrik di Semenanjung Malaysia.

Di Sabah, jumlah kapasiti terpasang tahun 2016 bagi stesen-stesen jana kuasa SESB dan penjana-penjana bebas ialah 1,490.55 MW dan kapasiti boleh harap ialah 1,229.79 MW. Kehendak maksimum di Sabah pula ialah 945 MW yang dicatatkan pada 25 April 2016, iaitu 3.4% lebih tinggi berbanding 914 MW pada tahun 2015. Jumlah penjanaan elektrik pula ialah 6,051.52 GWj dengan 88.36% daripadanya dijana menggunakan gas asli.

Bagi negeri Sarawak pula, jumlah kapasiti terpasang tahun 2016 bagi stesen-stesen jana kuasa SEB dan penjana bebas ialah 4,644.20 MW dan kapasiti tersedia ialah 4,128.70 MW. Sebahagian besar kapasiti ini disumbangkan oleh stesen jana kuasa hidro dengan kapasiti terpasang 2,400 MW. Bahan api kedua tertinggi digunakan oleh stesen jana kuasa ialah gas asli, diikuti oleh arang batu dan diesel.

Kehendak maksimum Sarawak pada tahun 2016 ialah 3,010 MW iaitu 31.6% lebih tinggi daripada 2,288 MW pada tahun 2015. Jumlah penjanaan tenaga elektrik pada tahun 2016 juga meningkat 44.83% kepada 22,428.62 GWj berbanding tahun 2015.

Selain daripada bahan api fosil, bahan api lain dalam industri pembekalan elektrik di Malaysia ialah tenaga boleh diperbaharui (TBB), contohnya biojisim, biogas, solar dan hidro mini. Berdasarkan laporan yang dihantar oleh pemegang-pemegang lesen, sebanyak 359.67 GWj dijana menggunakan TBB di Semenanjung Malaysia dan 243.06 GWj di Sabah. Majoriti TBB di Semenanjung ialah kuasa solar, manakala di Sabah lebih kepada sumber biojisim.

SITUATION OF ELECTRICITY SUPPLY AND DEMAND

Total installed capacity of Peninsular Malaysia's major power stations increased to 22,910.50 MW in 2016 from 20,710 MW in 2015. It was the result of newly commissioned power stations, such as TNB Connaught Bridge, Tanjung Bin Energy, TNB Prai, Ulu Jelai and Tembat. The maximum demand increased by 5.7% recorded at 17,788 MW on 20 April 2016 due to the El Nino phenomena that hit the country.

Electricity generated by the major power stations also increased to 121,688.47 GWh with the highest recorded daily generation at 372.5 GWh on 20 April 2016. In terms of fuel mix, coal still dominating the share in Peninsular Malaysia.

In Sabah, 2016 installed capacity of SESB's and IPPs' power stations in 2016 was 1,490.55 MW and the dependable capacity was 1,229.79 MW. The maximum demand in Sabah was recorded on 25 April 2016 at 945 MW, an increase of 3.4% compared to 914 MW in 2015. Total electricity generated was 6,051.52 GWj with 88.36% of it was by natural gas.

In Sarawak, installed capacity of SEB's and IPP's power stations was 4,644.20 MW and the available capacity was 4,128.70 MW. The biggest share came from the hydro power at 2,400 MW, followed by natural gas as second largest then coal and diesel.

Sarawak's maximum demand in 2016 was 3,010 MW, which was 31.6% higher than 2,288 MW in 2015. Electricity generation also increased by 44.83% to 22,428.62 GWh compared to 2015's data.

Beside fossil fuels, renewable energy (RE) such as biomass, biogas, solar and mini hydro also contribute a small share in electricity generation in Malaysia. Based on the reports submitted by RE licensees, 359.67 GWh was generated in Peninsular Malaysia and 243.06 GWh in Sabah using RE fuels. Most of the RE power plants in Peninsular were solar powered while Sabah's were more on biomass.

PRESTASI SISTEM PENJANAAN

Prestasi sektor penjanaan elektrik diukur menggunakan beberapa penunjuk seperti purata kecekapan *thermal*, faktor kesediaan setara (*equivalent availability factor*,

PERFORMANCE OF GENERATION SYSTEM

Performance of the electricity generation sector is measured using several indicators, such as average thermal efficiency, equivalent availability factor (EAF) and

EAF) dan faktor henti tugas tidak berjadual (*equivalent unplanned outage factor*, EUOF). Di Sarawak, penunjuk yang digunakan adalah sama kecuali EUOF yang menggunakan FOR, iaitu *force outage rate.*

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 semua stesen jana kuasa telah meningkat 0.2% hingga 0.5% berbanding tahun 2015. Ini berikutan mula tugas Stesen Jana Kuasa Tanjung Bin Energy, Stesen Jana Kuasa TNB Prai dan Stesen Jana Kuasa TNB Connaught Bridge.

Average thermal efficiency

In Peninsular Malaysia, the average thermal efficiency of all power stations has increased by 0.2% to 0.5% compared to performance in 2015. This is due to the commissioning of Tanjung Bin Energy Power Station, TNB Prai Power Station and TNB Connaught Bridge Power Station.

Stesen-stesen jana kuasa yang baru adalah lebih cekap dan secara tidak langsung telah meningkatkan kecekapan *thermal* keseluruhan. Sebelum adanya stesen-stesen jana kuasa baharu ini, sesetengah jana kuasa lama beroperasi dalam mod *cyclic* atau *half block operation*. Dalam keadaan sebegini, kecekapan *thermal* adalah lebih rendah kerana pengoperasiannya bukanlah pada tahap yang optimum.

New power stations are more efficient and will indirectly improve the overall thermal efficiency. Prior to the commissioning of these new power stations, there were longstanding power stations operating in cyclic mode or half block operation. In such modes, thermal efficiency is lower since the operation was at non-optimum level.

Di Sabah, purata kecekapan *thermal* stesen jana kuasa IPP meningkat sekitar 0.5% hingga 0.8% dengan beroperasinya stesen jana kuasa baharu Kimanis Power Sdn. Bhd. dan SPR Energy Sdn. Bhd.. Situasi berbeza pula terjadi pada stesen jana kuasa SESB, iaitu kecekapan *thermal*nya menurun sekitar 0.5% hingga 2%. Keadaan ini berlaku akibat stesen jana kuasa kitar padu yang dimakan usia (berusia lebih 30 tahun) dan henti tugas tidak terancang.

Since the commissioning of Kimanis Power Sdn. Bhd. and SPR Energy Sdn. Bhd.'s new power stations, the average thermal efficiency of IPPs in Sabah has increased around 0.5% to 0.8%. While on the other hand, the performance of SESB power plants decreased by 0.5% to 2% due to the aging combined cycle power plants (over 30 years old) and unscheduled downtime.

Di Sarawak, kecekapan *thermal* bagi stesen jana kuasa kitar terbuka tidak banyak berubah, daripada 19.92% pada 2015 kepada 19.11% pada tahun 2016. Kecekapan *thermal* stesen jana kuasa kitar padu dan diesel meningkat sekitar 3% hingga 4%, manakala kecekapan *thermal* stesen jana kuasa konvensional (arang batu) pula menurun 3%.

In Sarawak, thermal efficiency of open cycle power stations has not changed much, from 19.92% in 2015 to 19.11% in 2016. Combined cycle and diesel power stations recorded about 3% to 4% increase of thermal efficiency, while conventional (coal) power stations recorded a decrease of 3%.

Faktor kesediaan setara (equivalent availability factor, EAF)

Equivalent availability factor (EAF)

Dari segi faktor kesediaan setara, pencapaian stesen jana kuasa kitar padu dan konvensional (arang batu) di Semenanjung Malaysia adalah konsisten dengan peningkatan sekitar 3%. Pencapaian ini didorong oleh kestabilan bekalan bahan api. Bagi stesen jana kuasa konvensional (minyak/gas) dan hidro, EAF masih berada pada tahap yang baik, walaupun menurun sekitar 3% hingga 4% berikutan pelaksanaan henti tugas berjadual.

In terms of equivalent availability factor, performance of combined cycle and conventional (coal) power stations in Peninsular Malaysia were consistent. The increase was about 3% and the achievement was driven by a stable fuel supply. EAF for conventional (oil/gas) and hydro power stations were still at a decent level, although it showed a drop of about 3% to 4% due to the scheduled downtime.

EAF stesen-stesen jana kuasa diesel IPP di Sabah meningkat dengan sangat ketara iaitu sebanyak 44.6%, manakala stesen-stesen jana kuasa diesel SESB pula konsisten dengan peningkatan sekitar 0.8% sahaja. Stesen-stesen jana kuasa kitar padu pula mencatatkan EAF yang lebih rendah di mana penurunan 1.55% untuk stesen jana kuasa IPP dan 8.66% untuk stesen jana kuasa SESB disebabkan oleh henti tugas berjadual.

In Sabah, EAF of IPP's diesel power stations increased significantly by 44.6% meanwhile SESB's diesel power stations were consistent with the increment of only 8%. The combined cycle power plants recorded lower EAF, where IPP recorded 1.55% reduction and SESB recorded 8.66% due to the scheduled downtime.

EAF stesen jana kuasa kitar padu dan diesel di Sarawak meningkat, masing-masing 9.3% dan 4.1%. Sebaliknya, EAF stesen jana kuasa kitar terbuka dan konvensional arang batu menurun 4.1% dan 8.6% masing-masing.

Sarawak's combined cycle and diesel power stations had higher EAF, which increased 9.3% and 4.1% respectively. Meanwhile, open cycle and conventional coal power stations' EAF decreased by 4.1% and 8.6%.

Faktor henti tugas tidak berjadual (*equivalent unplanned outage factor*, EUOF) / *Force outage rate*, FOR

Di Semenanjung, faktor henti tugas tidak berjadual (EUOF) bagi hampir semua jenis stesen jana kuasa pada tahun 2016 meningkat sekitar 1% hingga 2%. Walau bagaimanapun, ia tidak termasuk stesen jana kuasa kitar padu TNB dan konvensional (arang batu) IPP.

EUOF stesen-stesen jana kuasa kitar padu SESB meningkat 3%, manakala EUOF stesen-stesen jana kuasa diesel IPP pula berkurang dengan ketara. Pengurangan tersebut dicapai selepas unit jana kuasa yang rosak sepenuhnya dikeluarkan daripada pengiraaan kapasiti boleh harap Sabah. Selain itu, EUOF stesen-stesen jana kuasa hidro pula meningkat sebanyak 11% disebabkan oleh kerja-kerja baik pulih dan senggaraan yang dilaksanakan pada suku ketiga (Q3) dan suku keempat (Q4) tahun 2016.

Di Sarawak, FOR bagi semua jenis stesen jana kuasa menurun 0.5% hingga 2.6% kecuali stesen jana kuasa konvensional (arang batu).

Equivalent unplanned outage factor (EUOF) / Force outage rate, FOR

In Peninsular Malaysia, EUOF of almost all power stations increased by about 1% to 2% in 2016, except TNB's combined cycle power stations and IPP's conventional (coal) power stations.

EUOF of SESB's combined cycle power stations increased by 3%, while diesel power stations recorded a significant decrease. Lower EUOF was achieved by excluding damaged power stations from Sabah's installed capacity calculation. EUOF of hydropower stations increased by 11% due to overhaul and maintenance work performed in the third quarter (Q3) and fourth quarter (Q4) of 2016.

In Sarawak, FOR of all power stations decreased by 0.5% to 2.6% except the FOR of conventional (coal) power stations.

PRESTASI SISTEM PENGHANTARAN

Daya Harap Sistem

Berdasarkan rekod lima tahun ke belakang bagi *Delivery Point Unrealibility Index* (DePUI), prestasi sistem penghantaran TNB di Semenanjung menunjukkan kemerosotan.

Sejak tahun 2012, DePUI berterusan meningkat daripada 0.95 minit kepada 1.43 minit. Dalam tempoh ini, kenaikan ialah sebanyak 123% iaitu daripada 0.64 minit kepada 1.43 minit. Secara keseluruhannya, prestasi sistem minit bagi grid nasional tahun 2016 masih berada di tahap yang baik kerana tidak melebihi sasaran yang ditetapkan iaitu 1.5 minit.

Pada tahun 2016, terdapat tiga pelantikan dengan kehilangan beban 83 MW, 288 MW dan 104 MW termasuk satu insiden lucutan beban yang melibatkan beberapa kawasan di negeri Perak pada 20 Jun 2016.

Pada tahun 2016, prestasi sistem grid Negeri Sabah menunjukkan penurunan sebanyak 86.5% iaitu daripada 108.87 minit pada tahun 2015 kepada 14.7 minit. Daripada 14.7 minit tersebut, 8.63 minit disumbangkan oleh insiden yang melibatkan talian 132kV Beaufort - Ranca-ranca, talian132kV Beaufort - Lansat dan talian132kV Beaufort-Papar pada 16 Julai 2016. Tiada perlantikan yang melibatkan kehilangan beban melebihi 50 MW pada tahun 2016.

PERFORMANCE OF TRANSMISSION SYSTEM

System Reliability

In the last 5 years, TNB transmission recorded a declining performance based on Delivery Point Unreliability Index (DePUI) data.

Since 2012, DePUI has continuously increasing from 0.95 minutes to 1.43 minutes in 2016. Within this period, the rise was 51% and between 2015 to 2016, the rise was 123% that is from 0.64 minutes to 1.43 minutes. Overall, the performance of the system minutes of national grid in 2016 is still good within 1.5 minutes that is the targeted level.

In 2016, there were three tripping with load losses of 83 MW, 288 MW and 104 MW including a load shedding which involved several areas in Perak on 20 June 2016.

Sabah's system minutes showed a reduction of 86.5% from 108.97 minutes in 2015 to 14.7 minutes in 2016. Out of it, 8.63 minutes were caused by incidents on 16 July 2016 involving 132kV Beaufort - Ranca-ranca, 132kV Beaufort - Lansat and 132kV Beaufort - Papar lines. No tripping involving load loss more than 50MW occurred in 2016.

PRESTASI SISTEM PENGAGIHAN

Pencapaian SAIDI di Semenanjung dan Sabah

Pada tahun 2016, SAIDI Semenanjung Malaysia ialah 49.29 minit/pelanggan/tahun, berbanding 51.49 minit/pelanggan/tahun pada tahun 2015. Antara tahun 2014

PERFORMANCE OF DISTRIBUTION SYSTEM

SAIDI in Peninsular and Sabah

In 2016, SAIDI of Peninsular Malaysia was 49.29 minutes/customer/year, 4.3% lower compared to 2015 record. Between 2014-2016, SAIDI performance has improved

hingga 2016, SAIDI menunjukkan *trend* menurun daripada 56.65 kepada 49.29 minit/pelanggan/tahun.

with a downward trend of 56.65 to 49.29 minutes/year.

Sebagai inisiatif untuk mencapai SAIDI yang lebih rendah dari tahun ke tahun, TNB telah melaksanakan pelan penambahbaikan pada kabel bawah tanah voltan sederhana kerana 70% daripada SAIDI adalah berpunca daripadanya.

This reduction is the positive result of TNB's action plan on the medium voltage system, which 70% of the interruptions came from the underground cables.

Bagi NUR Distribution Sdn. Bhd, SAIDI keseluruhan yang dicatatkan di Kulim Hi-Tech Park (KHTP) ialah 20.49 minit/pelanggan/tahun. Ia jauh lebih tinggi daripada hanya 4.32 minit/pelanggan/tahun pada tahun 2015.

Overall SAIDI performance of NUR Distribution Sdn. Bhd. in Kulim Hi-Tech Park (KHTP) was 20.49 minutes/customer/year which was much higher than 2015's SAIDI at 4.32 minutes/customer/year.

SAIDI keseluruhan Sabah menurun 18% kepada 311.01 minit/pelanggan/tahun berbanding 379.26 minit/pelanggan/tahun pada tahun 2015. Daripada jumlah ini, 221.67 minit/pelanggan/tahun ialah daripada sektor pengagihan. Walaupun mengalami penurunan, SAIDI tahun 2016 masih tersasar daripada pencapaian 250 minit/pelanggan/tahun yang ditetapkan.

Overall SAIDI in Sabah dropped 18% from 379.26 minutes/customer/year in 2015 to 311.01 minutes in 2016, of which 221.67 minutes/customer/year contributed by the distribution sector. Despite of the reduction in 2016, it still did not meet the targeted SAIDI of 250 minutes/customer/year for Sabah.

Gangguan Bekalan Elektrik

Interruptions of electricity supply

Semenanjung Malaysia mencatatkan 6.84 gangguan bekalan elektrik bagi setiap 1,000 pengguna pada tahun 2016. Lebih 90% gangguan bekalan berpunca daripada gangguan tidak berjadual sama seperti tahun 2014 dan 2015. Walau bagaimanapun, kedua-dua gangguan berjadual dan tidak berjadual telah menurun sebanyak 5.96% dan 7.9% masing-masing.

Peninsular Malaysia had 6.84 electricity supply interruptions per 1000 consumers in 2016 and similarly as in 2014 and 2015, more than 90% were caused by the unscheduled interruptions. However, both scheduled and unscheduled interruptions recorded a reduction of 5.96% and 7.9% respectively.

Di KHTP, sebanyak 24.55 gangguan bekalan elektrik dilaporkan bagi setiap 1,000 pengguna, di mana 57.7% berpunca daripada gangguan berjadual. Jika dibandingkan dengan tahun 2015, penurunan yang dicatatkan pada tahun 2016 ialah 1.2%, dengan majoriti penurunan pada gangguan berjadual.

In KHTP, a total of 24.55 electricity supply interruptions were reported for every 1,000 consumers, of which 57.7% was caused by scheduled interruptions. Compared to 2015, the interruption was lowered by 1.2% mainly on the scheduled interruptions.

Bilangan gangguan bekalan elektrik bagi setiap 1,000 pengguna di Sabah juga berkurang sebanyak 1.8% daripada 35.13 kepada 34.49 pada tahun 2016.

The number of electricity supply interruptions for every 1,000 consumers in Sabah also decreased by 1.8% from 35.13 to 34.49 in 2016.

Sejak 2012, gangguan tidak berjadual menyumbang lebih 90% daripada jumlah gangguan tersebut. Walau bagaimanapun, ganguan tidak berjadual ini semakin berkurangan dari tahun ke tahun dan pada tahun 2016, ia telah berkurang sebanyak 3.5% berbanding tahun 2015. Gangguan berjadual pula meningkat sebanyak 29.3% iaitu daripada 1.81 kepada 2.34.

Since 2012, unscheduled interruptions account for over 90% of the total interruptions. However, unscheduled interruption has been declining from year to year and in 2016, it has decreased by 3.5% compared to 2015. Scheduled interruptions increased by 29.3% from 1.81 to 2.34.

PRESTASI KUALITI KUASA

PERFORMANCE OF POWER QUALITY

Sebanyak 923 kejadian junaman voltan berlaku di Semenanjung Malaysia pada tahun 2016, di mana bacaan tertinggi SARFI70 sebanyak 8.25 dicatatkan oleh negeri Kelantan, diikuti dengan Pahang (3.89) dan Terengganu (2.63).

Peninsular Malaysia had 923 voltage dip incidents in 2016, compared to 901 incidents in 2015, where Kelantan recorded the highest reading of SARFI70 at 8.25 followed by Pahang (3.89) and Terengganu (2.63).

Dari segi kejadian junaman voltan, bilangan aduan tertinggi direkodkan di Perak dengan 131 aduan, namun bilangan pengguna terlibat hanyalah 14 sahaja. Aduan yang melibatkan pengguna tertinggi ialah Pulau Pinang dengan 51 pengguna bagi 47 kejadian junaman voltan.

In terms of lodged complaints, Perak had 131 complaints on voltage dip while the affected consumers were only 14. Complaints involving highest number of consumers were recorded by Pulau Pinang with 51 consumers affected by 47 voltage dip incidents.

Bilangan insiden junaman voltan di KHTP menurun dari 22 insiden pada tahun 2015 kepada 19 insiden pada tahun 2016. Bilangan pengguna yang terlibat juga berkurangan sebanyak 31.25 % dari 32 kepada 22 pengguna pada tahun 2016. Insiden junaman voltan yang disebabkan oleh sistem NUR meningkat daripada 2 insiden kepada 5 manakala insiden berpunca dari sistem penghantaran TNB berkurangan sebanyak 30%.

In KHTP, number of voltage dip incidents dropped from 22 in 2015 to 19 in 2016. Number of affected consumers has also reduced by 31.25% from 32 to 22 consumers in 2016. Voltage dip triggered by NUR system increased from 2 in 2015 to 5 in 2016, while those triggered by TNB transmission system decreased by 30%.

Malaysia Sepintas Lalu
Malaysia @ a Glance

	2013	2014	2015	2016
Keluasan (km^2)* *Area (km^2)**	330,396	330,323	330,345	330,345
Penduduk (Juta) • *Population (million)*				
Jumlah *Total*	30.21	30.71	31.19	31.63
Lelaki *Male*	15.60	15.87	16.11	16.35
Perempuan *Female*	14.61	14.84	15.07	15.29
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	1,157,723 [e]	1,230,120 [p]
KDNK pada harga malar 2010 (RM juta) *GDP at constant 2010 prices (RM million)*	955,080	1,012,449	1,063,355 [e]	1,108,227 [p]
Pertumbuhan KDNK (%) *GDP Growth (%)*	4.7	6.0	5.0 [e]	4.2 [p]
KDNK per kapita pada harga semasa (RM) *GDP per capita at current prices (RM)*	33,714	36,030	37,123 [e]	38,887 [p]
Guna Tenaga • *Employment* [2]				
Tenaga Buruh ('000) *Labour Force ('000)*	13,980.5	14,263.6	14,518.0	14,667.8
Penduduk Bekerja ('000) *Employed ('000)*	13,545.4	13,852.6	14,067.7	14,163.7

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: 2 April 2018 *Updated: 2 April 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*

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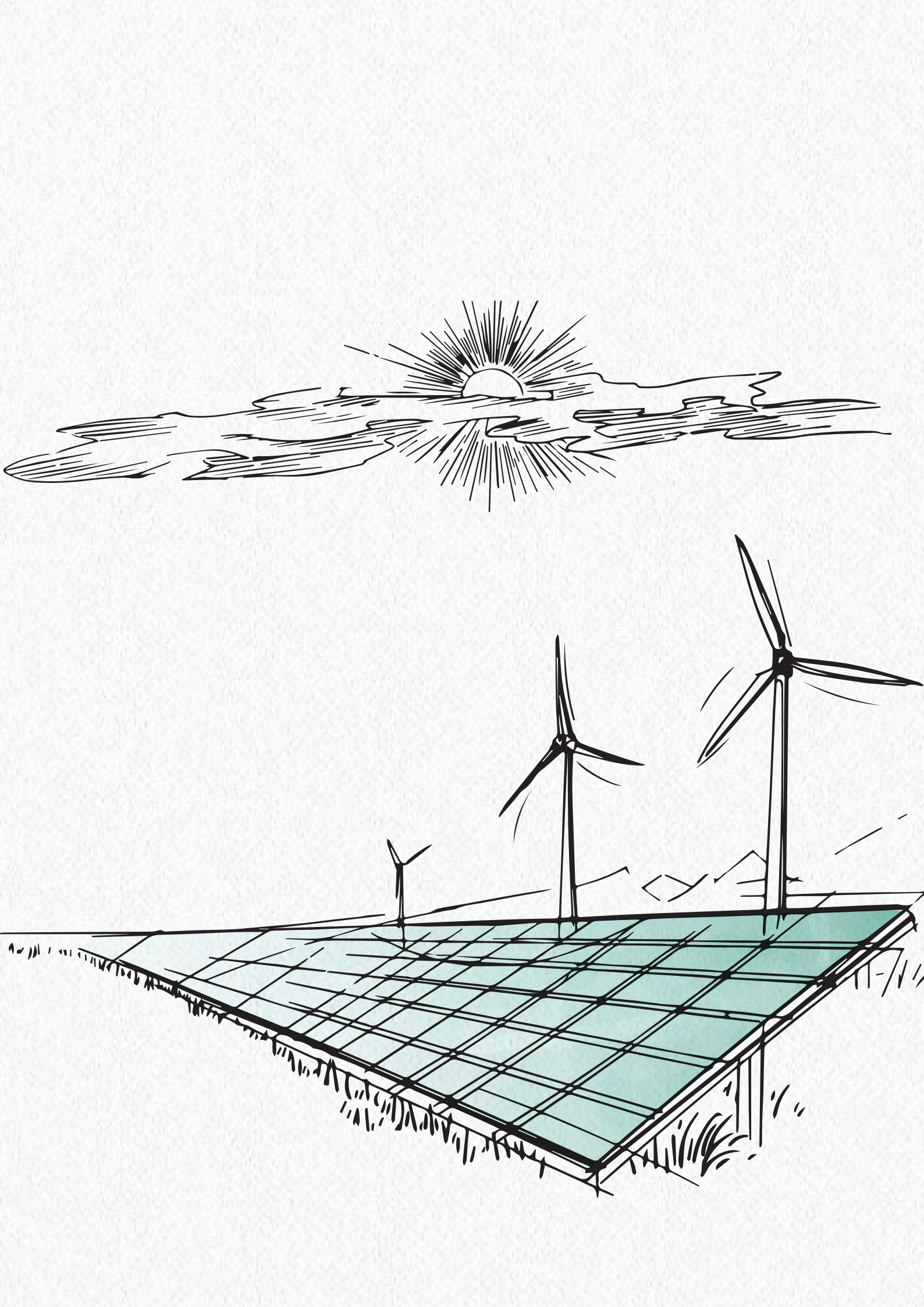
Semenanjung Malaysia
Peninsular Malaysia

Maklumat dan Statistik
Information and Statistics



Jadual 1: Maklumat utama prestasi Tenaga Nasional Berhad (TNB)
Table 1: Key information on Tenaga Nasional Berhad (TNB) performance

Petunjuk • *Indicator*	**Unit**	**2012**	**2013**	**2014**	**2015**	**2016**
Kehendak maksimum *Maximum demand*	MW	15,826	16,562	16,901	16,822	17,788
Jumlah unit penjanaan[1] *Total units generated [1]*	GWj *GWh*	26,329	24,914	28,409	27,374	24,046
Jumlah unit jualan [2] *Total units sold [2]*	GWj *GWh*	97,243	100,999	103,448	105,559	110,199
Hasil jualan elektrik *Sales revenue of electricity*	RM Juta *RM Million*	32,464	33,857	40,202	41,646	43,583
Kapasiti terpasang [3] *Installed capacity [3]*	MW	6,986	6,866	6,616	6,299	6,107
Jumlah kakitangan [4] *Number of employees [4]*	Orang *Person*	28,105	34,972	36,105	35,896	35,588
Hasil jualan elektrik per kakitangan *Sales revenue of electricity per employee*	RM Juta/Kakitangan *RM Million Employee*	1.16	0.97	1.11	1.16	1.22
Unit jualan per kakitangan *Units sold per employee*	GWj/ Kakitangan *GWh/ Employee*	3.46	2.89	2.87	2.94	3.10
Kapasiti terpasang per kakitangan *Installed capacity per employee*	MW/ Kakitangan *MW/ Employee*	0.25	0.20	0.18	0.19	0.17
Jumlah unit pembelian [5] *Total purchased units [5]*	GWj *GWh*	81,733	86,767	86,335	87,816	97,839
Jumlah unit eksport *Total exported units*	GWj *GWh*	13	17 [6]	17 [6]	3 [6]	0.74 [6]
Jumlah unit import *Total imported units*	GWj *GWh*	100	220 [6]	22 [6]	13 [6]	33 [6]

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 penjanaan terpasang bagi TNB tidak termasuk penjana-penjana bebas (IPP) *Installed generation capacity for TNB excludes IPPs*
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 Jabatan Single Buyer, TNB *Single Buyer Department, TNB*

Jadual 2: Kapasiti terpasang (MW) & ketersediaan keseluruhan TNB
Table 2: TNB installed capacity (MW) & overall availability

Tahun *Year*	**Hidro** *Hydro*	**Gas asli** *Natural gas*	*Medium fuel oil / Diesel / Distillate*	**Jumlah** *Total*	**Ketersediaan keseluruhan (%)** *Overall availllability (%)*
2012	1,911	5,075	-	6,986	93.50
2013	1,911	4,955	-	6,866	92.40
2014	1,911	4,705	-	6,616	86.70
2015	2,161	4,590	-	6,751	89.90
2016	2,529	3,578	-	6,107	94.78

Jadual 3: Campuran penjanaan TNB (GWj)
Table 3: TNB generation mix (GWh)

Tahun *Year*	**Hidro** *Hydro*	**Gas asli** *Natural gas*	*Medium fuel oil / Diesel / Distillate*	**Jumlah** *Total*
2012	5,524	19,558	1,247	26,329
2013	5,392	19,394	128	24,914
2014	4,111	24,298	-	28,409
2015	5,007	22,367	-	27,374
2016	3,838	20,208	1	24,046

Jadual 4: Jualan tenaga elektrik TNB (GWj)
Table 4: TNB electricity sales (GWh)

Tahun *Year*	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Perlombongan *Mining*	Pertanian *Agriculture*	Eksport *Export*	Jumlah *Total*
2012	20,301	33,218	42,047	1,235	98	344	13	97,256
2013	21,601	34,878	42,721	1,302	121	375	17	101,015
2014	22,350	35,801	43,380	1,370	133	414	17	103,465
2015	23,231	36,645	43,754	1,357	105	467	3	105,562
2016	25,745	39,447	42,977	1,374	113	543	0.74	110,200

Jadual 5: Bilangan pengguna TNB
Table 5: TNB number of consumers

Tahun *Year*	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Perlombongan *Mining*	Pertanian *Agriculture*	Unit percuma* *Free units**	Jumlah *Total*
2012	6,456,647	1,334,371	27,599	56,715	22	1,241	2,271	7,878,866
2013	6,503,417	1,334,856	27,954	61,121	27	1,494	2,406	7,931,275
2014	6,710,032	1,404,501	24,852	63,340	29	1,574	2,385	8,206,713
2015	6,920,122	1,475,306	27,672	65,888	28	1,627	2,414	8,493,057
2016	6,989,968	1,464,815	27,556	67,808	34	1,808	2,529	8,554,518

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.*

SISTEM PENGHANTARAN TNB
TNB TRANSMISSION SYSTEM

Jadual 6: Keupayaan sistem penghantaran TNB
Table 6: TNB transmission system capacity

Tahun • *Year*	2012	2013	2014	2015	2016
TALIAN/KABEL SISTEM PENGHANTARAN • *TRANSMISSION SYSTEM LINES/CABLES*					
500 kV (km)	668	668	668	722	784
275 kV (km)	8,449	8,534*	8,714*	9,517	9,518
132 kV (km)	11,640	11,891	12,088	12,151	12,175
PENCAWANG PENGHANTARAN • *TRANSMISSION SUBSTATIONS*					
Bilangan *Number*	401	404	414	419	427
Kapasiti (MVA) *Capacity (MVA)*	94,265	95,960	99,478	103,545	104,780

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

SISTEM PENGAGIHAN TNB
TNB DISTRIBUTION SYSTEM

Jadual 7: Keupayaan sistem pengagihan TNB
Table 7: TNB distribution system capacity

Tahun • *Year*	2012	2013	2014	2015	2016
TALIAN/KABEL SISTEM PENGAGIHAN • *DISTRIBUTION SYSTEM LINES/CABLES*					
Talian atas (km) *Overhead lines (km)*	495,925	487,385	516,780	532,403	532,403
Kabel bawah tanah (km) *Underground cables (km)*	423,758	555,272	678,026	697,159	697,159
PENCAWANG PENGAGIHAN • *DISTRIBUTION SUBSTATIONS*					
Bilangan *Number*	67,925	68,509	70,286	74,417	74,417
Keupayaan (MVA) *Capacity (MVA)*	126,969	127,217	128,717	131,465	131,465*

Nota • *Notes:*
Data diperolehi daripada Tenaga Nasional Berhad Integrated Annual Report 2016 *Data obtained from Tenaga Nasional Berhad Integrated Annual Report 2016*

Jadual 8: Stesen-stesen jana kuasa TNB dan penjana-penjana bebas di Semenanjung Malaysia

Table 8: TNB and IPP power stations in Peninsular Malaysia

	Stesen jana kuasa *Power station*	Jenis *Type*	Sumber tenaga *Energy source*	Kapasiti terpasang (MW) *Installed capacity (MW)*	Kapasiti tersedia (MW) *Available capacity (MW)*
TNB	SJ Sungai Perak Scheme	Hidro *Hydro*	Hidro *Hydro*	2,521.00	2,502.00
	SJ Pergau				
	SJ Sultan Mahmud, Kenyir				
	SJ Cameron Highlands Scheme				
	SJ Hulu Terengganu				
	SJ Ulu Jelai				
	SJ Tembat				
	SJ Putrajaya	OCGT	Gas asli *Natural gas*	252.00	246.00
	SJ Jambatan Connaught	CCGT		4,732.00	4,763.00
	SJ Sultan Iskandar, Pasir Gudang				
	SJ Sultan Ismail, Paka				
	SJ Gelugor				
	SJ Tuanku Jaafar, Port Dickson				
			Jumlah kecil *Subtotal*	**7,505.00**	**7,511.00**
IPP	TNB Janamanjung Sdn. Bhd.	Thermal	Arang batu *Coal*	3,080.00	3,080.00
	TNB Janamanjung Sdn. Bhd.				
	Tanjung Bin Power Sdn. Bhd.			5,986.00	5,993.00
	Jimah Energy Ventures Sdn. Bhd., Port Dickson				
	Kapar Energy Ventures Sdn. Bhd.				
	Kapar Energy Ventures Sdn. Bhd.				
	Tanjung Bin Energy Sdn. Bhd.				
	Kapar Energy Ventures Sdn. Bhd.	Thermal konvensional *Conventional thermal*	Gas asli *Natural gas*	564.00	571.00
	Kapar Energy Ventures Sdn. Bhd.	OCGT	Gas asli *Natural gas*	1,076.50	1,068.00
	Powertek Berhad, Telok Gong				
	Port Dickson Power Berhad, Port Dickson				
	Pahlawan Power Sdn. Bhd., Telok Gong	CCGT	Gas asli *Natural gas*	4,699.00	4,655.00
	GB3 Sdn. Bhd., Lumut				
	Panglima Power Berhad, Telok Gong				
	Teknologi Tenaga Perlis Consortium Sdn. Bhd., Perlis				
	Prai Power Sdn. Bhd., Prai				
	Kuala Langat Power Plant Sdn. Bhd., Kuala Langat				
	Segari Energy Ventures Sdn. Bhd., Lumut				
	TNB Prai Sdn. Bhd.				
	TNB Connaught Bridge Sdn. Bhd.				
			Jumlah kecil *Subtotal*	**15,405.50**	**15,367.00**
			JUMLAH *TOTAL*	**22,910.50**	**22,878.00**

Nota • *Notes:*
Maklumat dalam jadual ini tidak mengandungi kapasiti yang bersambung di talian pengagihan *Information in this table does not include capacity at distribution level*

Jadual 9: Penjanaan stesen jana kuasa TNB dan penjana-penjana bebas di Semenanjung Malaysia
Table 9: Generation of TNB and IPP power stations in Peninsular Malaysia

Sumber tenaga *Energy source*	Campuran penjanaan (GWj) • *Generation mix (GWh)*					
	ARANG BATU *COAL*	GAS ASLI *NATURAL GAS*	GAS ASLI & MINYAK *NATURAL GAS & OIL*	*MFO/ DISTILLATE/ DIESEL*	HIDRO *HYDRO*	JUMLAH *TOTAL*
TNB	-	20,207.53	-	0.74	3,837.67	**24,045.94**
PENJANA-PENJANA BEBAS *IPP*	63,156.44	35,574.30	422.80	77.66	-	**99,231.20**
JUMLAH *TOTAL*	**63,156.44**	**55,781.83**	**422.80**	**78.40**	**3,837.67**	**123,277.14**

Nota • *Notes:*
Termasuk *Including* NUR Generation Sdn. Bhd.

Jadual 10: Stesen hidro mini TNB
Table 10: TNB mini hydro stations

Bil. *No.*	Stesen *Station*	Kapasiti terpasang (MW) *Installed capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
1.	Sungai Perdak, Pahang	0.34	0.87
2.	Sungai Pertang, Pahang	0.34	0.00
3.	Sungai Sia, Pahang	0.52	0.00*
4.	Sungai Sempam G2, Pahang	1.25	0.00*
5.	Sungai Bil, Perak	0.23	0.43
6.	Sungai Kinjang, Perak	0.33	1.00
7.	Sungai Asap, Perak	0.11	0.05
8.	Sungai Kenas, Perak	0.50	0.51
9.	Sungai Chempias, Perak	0.12	0.27
10.	Sungai Temelong, Perak	0.80	0.00*
11.	Sungai Tebing Tinggi, Perak	0.15	0.42
12.	Sungai Tawar Besar, Kedah	0.55	0.15
13.	Sungai Mahang, Kedah	0.45	2.52
14.	Sungai Mempelam, Kedah	0.38	1.01
15.	Sungai Sok, Kelantan	0.56	0.00*
16.	Sungai Lata Rek, Kelantan	0.25	0.00
17.	Sungai Renyok G1, Kelantan	0.80	1.76
18.	Sungai Renyok G2, Kelantan	0.80	0.00*
19.	Sungai Cheralak, Terengganu	0.48	0.06
20.	Sungai Berang, Terengganu	0.36	0.26
	JUMLAH *TOTAL*	**9.32**	**9.31**

Nota • *Notes:*
*Stesen hidro menjalani rehabilitasi yang dijadualkan siap pada Julai 2018 *Hydro stations are undergoing rehabilitation scheduled to complete by July 2018*

Jadual 11: Pemegang lesen projek tenaga boleh baharu (TBB) di Semenanjung Malaysia (Lesen yang sah setakat 31 Disember 2016)

Table 11: Licencees of renewable energy (RE) projects in Peninsular Malaysia (Valid licenses as of 31 December 2016)

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
1.	Achi Jaya Plantations Sdn. Bhd.	Lot 682 dan 1066, Mukim Chaah, Daerah Segamat, Johor.	Enjin gas *Gas engine*	Biogas	2/3/2010	1.25
2.	Bell Eco Power Sdn. Bhd.	Lot No. 4960, Parit Ju, Mukim Simpang Kiri, Daerah Batu Pahat, Johor.	Enjin gas *Gas engine*	Biogas	5/10/2009	2.00
3.	Betatechnic Sdn. Bhd.	Kilang Sawit Kekayaan, Sebahagian Lot 519, Mukim Paloh, Daerah Kluang, 86609 Kluang, Johor.	Enjin gas *Gas engine*	Biogas	22/7/2016	2.40
4.	Biopower Climate Care Sdn. Bhd.	Lot 3348, Mukim Bera, Daerah Km 32, Bahau-Keratong Highway, 72100 Pahang.	Enjin gas *Gas engine*	Biogas	16/5/2013	2.13
5.	FELDA Palm Industries Sdn. Bhd.	Lot PT34, Kilang Sawit Serting Hilir, Mukim Rompin, Daerah Jempul, Negeri Sembilan.	Enjin gas *Gas engine*	Biogas	4/8/2011	1.50
6.	FELDA Palm Industries Sdn. Bhd.	Kilang Sawit Maokil, Mukim Maokil, Daerah Labis,85300 Johor.	Enjin gas *Gas engine*	Biogas	15/12/2014	1.20
7.	FELDA Palm Industries Sdn. Bhd.	Kilang Sawit Tenggaroh, Felda Tenggaroh, Daerah Kota Tinggi, 81907 Johor.	Enjin gas *Gas engine*	Biogas	15/12/2014	1.20
8.	FELDA Palm Industries Sdn. Bhd.	Kilang Sawit Nitar, KM27, Jalan Nitar-Mersing, Mukim Nitar, Daerah Mersing, 86007 Johor.	Enjin gas *Gas engine*	Biogas	5/3/2015	1.60
9.	Gan Teng Siew Realty Sdn. Berhad	Lot 422, Mukim Rantau, Daerah Seremban, 71209 Negeri Sembilan.	Enjin gas *Gas engine*	Biogas	2/3/2015	2.40
10.	GLT Energy Sdn. Bhd.	Lot 25439, Mukim Keratong, Daerah Rompin, 26700 Pahang.	Enjin gas *Gas engine*	Biogas	17/11/2015	1.13
11.	GLT Energy Sdn. Bhd.	Lot 2388, Mukim Bera, Daerah Bera, 28320 Pahang.	Enjin gas *Gas engine*	Biogas	20/1/2016	1.13
12.	Green & Smart Sdn. Bhd.	Malpom Oil Palm Mill, Lot 3927 Mukim 11 Daerah Seberang Perai Selatan 14300 Pulau Pinang.	Enjin gas *Gas engine*	Biogas	28/12/2016	2.34
13.	Green & Smart Sdn. Bhd.	Kilang Sawit Felda Kahang Felda Kahang Timur, Daerah Kluang 86007 Johor.	Enjin gas *Gas engine*	Biogas	7/6/2016	2.00
14.	Jana Landfill Sdn. Bhd.	Air Hitam Sanitary Landfill, Compartment 6, Hutan Simpan Air Hitam, Mukim & Daerah Petaling, Jalan Seri Kembangan-Puchong, 43300 Seri Kembangan, Selangor.	Enjin gas *Gas engine*	Biogas	13/10/2001	2.00
15.	Jana Landfill Sdn. Bhd.	No. Lot 1595, 2958 & 2959, Batu 3 1/2, Mukim Jalan Bukit Kerayong, Jeram, Daerah Kuala Selangor, Selangor.	Enjin gas *Gas engine*	Biogas	25/6/2012	1.07
16.	Jeng Huat (Bahau) Realty Sdn. Bhd.	Sebahagian Lot PT 2035, Mukim Triang, Daerah Kemayan-Bera, 28380 Pahang.	Enjin gas *Gas engine*	Biogas	25/11/2014	1.20
17.	Kilang Kelapa Sawit Lekir Sdn. Bhd.	Lot 260, Mukim Jaya Baru, Daerah Perak Tengah, 32020 Perak.	Enjin gas *Gas engine*	Biogas	17/11/2015	1.00
18.	KUB-Berjaya Energy Sdn. Bhd.	No. Lot 25, 26, 36 Dan 37, Mukim Sungai Tinggi, Daerah Hulu Selangor, Selangor.	Enjin gas *Gas engine*	Biogas	8/4/2011	1.20
19.	KUB-Berjaya Energy Sdn. Bhd.	Lot PT 1682, Mukim Sungai Tinggi, Daerah Hulu Selangor, 40410 Selangor.	Enjin gas *Gas engine*	Biogas	15/9/2015	2.00

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
20.	KUB-Berjaya Energy Sdn. Bhd.	No. Lot 25, 36 & 37, Mukim Sungai Tinggi, Daerah Hulu Selangor, 40400 Selangor.	Enjin gas *Gas engine*	Biogas	30/8/2012	3.12
21.	Magenko Renewables (Ipoh) Sdn. Bhd.	Sebahagian No. Lot 41293, Mukim Hulu Kinta, Daerah Kinta, 31250 Perak.	Enjin gas *Gas engine*	Biogas	8/1/2015	1.20
22.	Megagreen Energy Sdn. Bhd.	Lot 14768, Kilang Sawit FELCRA Nasaruddin Bota Perak Tengah 32600 Perak	Enjin gas *Gas engine*	Biogas	19/7/2016	1.17
23.	Megagreen Energy Sdn. Bhd.	Kilang Kelapa Sawit FELCRA Seberang Perak Lot PT 142, Mukim Jaya Baru, 36800 Perak Tengah, Perak	Enjin gas *Gas engine*	Biogas	22/7/2016	2.34
24.	Megagreen Energy Sdn. Bhd.	Kilang Kelapa Sawit FELCRA Sungai Melikai Lot PTD 16437, Mukim Mersing, 86000 Mersing, Johor.	Enjin gas *Gas engine*	Biogas	19/7/2016	1.17
25.	Sime Darby TNBES Renewable Energy Sdn. Bhd.	Sebahagian No. Lot 5138, Mukim Bagan Datuk 36369 Daerah Hilir Perak, Perak	Enjin gas *Gas engine*	Biogas	2/11/2016	1.60
26.	Sime Darby TNBES Renewable Energy Sdn. Bhd.	Sebahagian No. PT Mlo 6529 Mukim Sedenak, 81000 Kulaijaya, Johor.	Enjin gas *Gas engine*	Biogas	2/11/2016	1.60
27.	Sungei Kahang Power Sdn. Bhd	Kilang Sawit Sungei Kahang Lot 403, Mukim Kahang Daerah Kluang, 86000 Johor.	Enjin gas *Gas engine*	Biogas	18/11/2015	3.18
28.	SWM Enviro Sdn. Bhd.	Seelong Environment Centre, No. Lot 8366, Mukim Senai, Daerah Kulai Jaya, 81300 Johor.	Enjin gas *Gas engine*	Biogas	4/8/2015	2.00
29.	Bell Eco Sdn. Bhd.	Sebahagian Lot 4960, Mukim Simpang Kiri, Daerah Batu Pahat, 83000 Johor.	Turbin stim *Steam turbine*	Biojisim *Biomass*	16/7/2014	11.00
30.	Biofuel Energy Resources Sdn. Bhd.	Sebahagian Lot 332, 333 & 3562, Mukim Batang Kali, Daerah Hulu Selangor, 44200 Selangor.	Turbin stim *Steam turbine*	Biojisim *Biomass*	9/1/2015	7.00
31.	Comintel Green Technologies Sdn. Bhd.	Lot PT 27045, Kuang, Mukim Rawang, Daerah Gombak, 48050 Selangor	Turbin stim *Steam turbine*	Biojisim *Biomass*	19/7/2016	2.45
32.	FTJ Bio Power Sdn. Bhd.	No. Lot PT 17478 (H.S(D) 722), Mukim Chemor, Daerah Jengka, Pahang.	Turbin stim *Steam turbine*	Biojisim *Biomass*	20/8/2013	13.50
33.	Maju Intan Biomass Energy Sdn. Bhd.	Sebahagian Lot 21570, Mukim Durian Sebatang, Daerah Hilir Perak, 36000 Perak.	Turbin stim *Steam turbine*	Biojisim *Biomass*	31/7/2013	12.93
34.	Tenaga Sulpom Sdn. Bhd.	No. Lot 3115 (Plot 2), Batu 34, Jalan Banting 43800 Dengkil, Selangor.	Turbin stim *Steam turbine*	Biojisim *Biomass*	5/1/2016	7.00
35.	United Plantations Berhad	PT17026 Pekan Pengkalan Baharu Manjung 34900 Perak	Enjin gas *Gas engine*	Biojisim *Biomass*	15/3/2016	1.20
36.	Amcorp Perting Hydro Sdn. Bhd.	Sungai Perting, Hutan Simpan Bukit Tinggi, Mukim Bentong II, Daerah Bentong, 28700 Pahang.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	2/3/2015	6.60
37.	I.S. Energy Sdn. Bhd.	Sungai Rek Daerah Kuala Krai 15000 Kelantan.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	14/5/2009	2.80
38.	Kerian Energy Sdn. Bhd.	Kawasan Sungai Kerian, Hutan Simpan Bintang Hijau Daerah Hutan Larut & Matang, Taiping, 34200 Perak.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	4/10/2016	14.23

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39.	Pesaka Technologies Sdn. Bhd.	Sungai Brooke, Mukim Lojing, Daerah Gua Musang, Kelantan.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	30/9/2010	12.00
40.	Renewable Power Sdn. Bhd.	Sungai Kerling, Kompartment 52 & 53, Hutan Simpan Gading, Mukim Kerling, Daerah Hulu Selangor. Selangor.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	14/9/2009	2.20
41.	Ace Pixel Sdn. Bhd.	Sebahagian Lot No. H.S(D) 07435, PT 19, Mas Cargo Complex, Zone B Free Commercial Zone, Southern Support Zone, Kuala Lumpur International Airport, 64000 Sepang, Selangor.	PV Modul	Solar	27/2/2014	0.40
42.	Ace Pixel Sdn. Bhd.	Sebahagian lot No. H.S(D) 07435, PT 19, Mas Cargo Complex, Zone B Free Commercial Zone, Southern Support Zone, Kuala Lumpur International Airport, 64000 Sepang, Selangor.	PV Modul	Solar	27/2/2014	0.40
43.	Acidchem International Sdn. Bhd.	Sebahagian Lot PT 3176, Mukim 1, Daerah Seberang Perai Tengah, 13600 Pulau Pinang.	PV Modul	Solar	2/4/2014	0.50
44.	Alliance Contract Manufacturing Sdn. Bhd.	Sebahagian Lot PT 2815, Mukim 01, 13700 Daerah Seberang Perai Tengah, Pulau Pinang.	PV Modul	Solar	15/12/2014	0.42
45.	Alpha Automation (Selangor) Sdn. Bhd.	No. Lot 6, Jalan Permata 2, Arab Malaysia Industria Park, 71800 Nilai Negeri Sembilan.	PV Modul	Solar	2/7/2012	0.18
46.	Am Rich Constructions & Development Sdn. Bhd.	No. Lot 7065, Mukim Johol, Daerah Kuala Pilah, 73100 Seremban, Negeri Sembilan.	PV Modul	Solar	13/11/2015	0.09
47.	Ambang Fiesta Sdn. Bhd.	Sebahagian Lot PT 4564, Mukim Kuala Perlis, 02000 Kangar, Perlis.	PV Modul	Solar	28/12/2012	5.00
48.	Ambang Fiesta Sdn. Bhd.	Lot PT 4564 (2889), Mukim Kuala Perlis, 02000 Kangar, Perlis.	PV Modul	Solar	22/11/2013	1.00
49.	Aneka Retail (M) Sdn. Bhd.	Sebahagian Lot 10239, Mukim Bandar Gurun, Daerah Kuala Muda,08300 Kedah.	PV Modul	Solar	2/12/2015	0.18
50.	APM Springs Sdn. Bhd.	Sebahagian Lot 29709 Seksyen 20, Kg. Baru Pandamaran, Bandar Port Swettenham, Daerah Klang, 42009 Selangor.	PV Modul	Solar	31/10/2016	0.42
51.	Aquaponics Energy Garden Sdn. Bhd.	Lot 3508, Mukim Kuala Muda, Daerah Sungai Petani,08000 Kedah.	PV Modul	Solar	30/12/2013	0.43
52.	Aquaponics Solar Farm Sdn. Bhd.	Lot 3499, Mukim Kuala Muda, Daerah Sungai Petani, 08000 Kedah.	PV Modul	Solar	30/12/2013	0.34
53.	Aspen Moments Sdn. Bhd.	No. Lot 603 Mukim 16 Daerah Seberang Perai Utara 13800 Seberang Prai.	PV Modul	Solar	23/12/2015	0.43
54.	AT Engineering Solution Sdn. Bhd.	Sebahagian Lot 124600, Mukim 12, Daerah Barat Daya, 11900 Pulau Pinang.	PV Modul	Solar	23/12/2015	0.43
55.	AT Precision Tooling Sdn. Bhd.	Sebahagian No. Lot 12340, Mukim 12, 11900 Daerah Barat Daya, Pulau Pinang.	PV Modul	Solar	2/11/2016	0.30
56.	Aten Sdn. Bhd.	Lot 6090, 28 1/2 Mile Salak Road, Mukim Dengkil, Daerah Sepang, 43800 Selangor.	PV Modul	Solar	8/1/2015	0.51

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57.	Atlantic Blue Sdn. Bhd.	Lot 999, Padang Sena, 06400 Bandar Pokok Sena, Kedah.	PV Modul	Solar	17/12/2014	1.00
58.	Autokit Design Technologies (M) Sdn. Bhd.	Sebahagian PT 5890, Mukim 13, Daerah Seberang Perai Selatan, 14100 Pulau Pinang.	PV Modul	Solar	4/10/2016	0.43
59.	Azminas Sdn. Bhd.	No. Lot 42366, Mukim Kapar, Daerah Klang, 42200 Selangor.	PV Modul	Solar	23/1/2015	0.43
60.	Bagan Datoh Solar Farm Sdn. Bhd.	Lot 9721 Mukim Hutan Melintang Daerah Bagan Datoh 36400 Perak.	PV Modul	Solar	26/11/2015	2.50
61.	Bagan Datoh Solar Farm Sdn. Bhd.	Sebahagian Lot 9717 (GM 4454), Mukim Hutan Melintang, Daerah Hilir Perak, 36400 Perak.	PV Modul	Solar	10/6/2013	2.50
62.	Beyond Solaris Sdn. Bhd.	Lot 74366 Mukim Gambang Daerah Kuantan 26300 Pahang.	PV Modul	Solar	8/1/2015	1.00
63.	Bhan Guang Trading Sdn. Bhd.	Lot 10051, Mukim 07, Daerah Seberang Perai Tengah, 14000 Pulau Pinang.	PV Modul	Solar	9/9/2016	0.12
64.	Bina Puri Norwest Sdn. Bhd.	Lot 1621, Jalan Prima Pelangi 6, Taman Bukit Prima Pelangi, Mukim Batu, 51200 Kuala Lumpur.	PV Modul	Solar	15/12/2014	0.30
65.	Binawani Sdn. Bhd.	Plaza Tol Batu, Km 3.0, Lebuhraya Duta-Ulu Kelang, Off Jalan Kuching, 51200 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur.	PV Modul	Solar	20/1/2016	0.41
66.	Biosun Energy Sdn. Bhd.	Sebahagian Lot 1788, Mukim Batang Padang, Daerah Batang Padang, 35400 Perak.	PV Modul	Solar	29/12/2015	1.00
67.	Broadway Victory Sdn. Bhd.	Lot PT 4236, H.S.(M) 6267, Mukim Kapar, Selat Kelang Utara, Selangor.	PV Modul	Solar	4/12/2012	0.99
68.	Candela Green Energy Sdn. Bhd.	No. Lot 17631, Kampung Bharu Gong Samak, Mukim Kuala Paka, 23100 Dungun, Terengganu.	PV Modul	Solar	29/12/2014	0.18
69.	Cathayana Ecotech Sdn. Bhd.	Lot 1048 Sek 28-1053, Mukim Lorong Tun Ismail 5, Daerah Kuantan, 25000 Pahang.	PV Modul	Solar	18/11/2015	0.09
70.	CEL Logistics Sdn. Bhd.	Lot PTD 149225, Mukim Tebrau, Daerah Johor Bahru, 81300 Johor.	PV Modul	Solar	8/11/2016	0.43
71.	Cemara Angsana Sdn. Bhd.	Sebahagian No. Lot Hs(D) 10045, PT 3980, Mukim Gemas, Daerah Tampin, 73400 Negeri Sembilan.	PV Modul	Solar	25/11/2013	4.50
72.	Cemara Angsana Sdn. Bhd.	Sebahagian No. Lot HS(D) 10045, PT 3980, Mukim Gemas, Daerah Tampin, 73400 Negeri Sembilan.	PV Modul	Solar	25/11/2013	1.26
73.	Ceria Suriamas Sdn. Bhd.	Sebahagian Lot 29 Sek. 36, Mukim Bandar Petaling Jaya, Daerah Petaling, 46300 Selangor.	PV Modul	Solar	8/11/2016	0.18
74.	Cheng Hua Engineering Works Sdn. Bhd.	P.T. 66271, Mukim Klang, 41200 Klang, Selangor.	PV Modul	Solar	30/12/2013	0.18
75.	Chiat Hin Envelope Manufacturer Sdn. Bhd.	Sebahagian Lot 2831, Mukim 01, Daerah Seberang Perai Tengah, 13600 Pulau Pinang.	PV Modul	Solar	4/8/2015	0.18
76.	Chung Hwa High School	Chung Hwa High School, Sebahagian Lot 3517, Mukim Bandar Maharani, Daerah Muar, 84000 Johor.	PV Modul	Solar	29/9/2016	0.18
77.	Cine Art Communication Sdn. Bhd.	Lot 305012, Mukim Hulu Kinta, Daerah Kinta, 31150 Perak.	PV Modul	Solar	26/8/2015	1.00

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78.	Pesaka Technologies Sdn. Bhd.	Sungai Brooke, Mukim Lojing, Daerah Gua Musang, Kelantan.	PV Modul	Solar	2/11/2016	0.10
79.	Renewable Power Sdn. Bhd.	Sungai Kerling, Kompartment 52 & 53, Hutan Simpan Gading, Mukim Kerling, Daerah Hulu Selangor. Selangor.	PV Modul	Solar	15/11/2013	4.00
80.	Cypark Suria (Negeri Sembilan) Sdn. Bhd.	Sebahagian Lot 7134, Tapak Pelupusan Pajam, Mukim Setul, 71700 Nilai, Negeri Sembilan.	PV Modul	Solar	25/6/2012	3.00
81.	Cypark Suria (Pajam) Sdn. Bhd.	Sebahagian Lot 7134, Tapak Pelupusan Pajam, Mukim Setul, 71700 Nilai, Negeri Sembilan.	PV Modul	Solar	25/6/2012	5.00
82.	Cypark Suria (Pajam) Sdn. Bhd.	Sebahagian Lot 7134, Mukim Setul, Daerah Seremban, 71700 Negeri Sembilan.	PV Modul	Solar	15/10/2015	0.10
83.	Cypark Suria (Pajam) Sdn. Bhd.	Lot 7134, Mukim Setul, Daerah Pajam, 71700 Negeri Sembilan.	PV Modul	Solar	25/4/2014	5.00
84.	Dato' Ir. Dr. Dennis Ganendra	Sebahagian Lot P.T. 17562, Mukim Klang, Daerah Klang, 40350 Selangor.	PV Modul	Solar	14/9/2012	0.81
85.	Dato' Ir. Dr. Dennis Ganendra	Sebahagian Lot No. 3861, 3862 & 3863, Mukim Sabai, Daerah Bentong, 28600 Pahang.	PV Modul	Solar	15/2/2013	0.99
86.	Dekad Aliran Suria Sdn. Bhd.	Sebahagian Lot 722 Mukim Husba Daerah Kubang Pasu 06000 Kedah.	PV Modul	Solar	27/12/2016	0.80
87.	Delloyd Holdings (M) Sdn. Bhd.	No. Lot 2592, Mukim Klang, Daerah Klang, 41200 Selangor.	PV Modul	Solar	29/4/2015	0.42
88.	Delloyd Holdings (M) Sdn. Bhd.	Lot 2755, Mukim Klang, Daerah Klang, 41200 Selangor.	PV Modul	Solar	13/11/2015	0.42
89.	Dexon Electrical Engineering Sdn. Bhd.	Sebahagian Lot 41580, Mukim Pekan Penaga, Daerah Petaling, 47610 Selangor.	PV Modul	Solar	9/9/2016	0.42
90.	Dickow Sdn. Bhd.	Plot 361, Bukit Minyak, Mukim 13, Daerah Tengah, 14100 Seberang Perai Tengah, Pulau Pinang.	PV Modul	Solar	15/12/2014	0.42
91.	E&W Venturetech Sdn. Bhd.	Sebahagian Lot 3764, Mukim Sungai Buluh, Daerah Petaling, 40150 Selangor.	PV Modul	Solar	2/3/2015	1.00
92.	Eagletech Industries Sdn. Bhd.	Lot PT 7645, Mukim Cheras Daerah Cheras 43200 Selangor.	PV Modul	Solar	19/2/2014	0.18
93.	Eco Integrated Sdn. Bhd.	Sebahagian Lot 1497, Mukim Gemas, Daerah Tampin, 73400 Gemas, Negeri Sembilan.	PV Modul	Solar	22/11/2016	0.43
94.	Eco Meridian Sdn. Bhd.	Sebahagian Lot 71413 Mukim 12, Daerah Barat Daya 11900 Pulau Pinang	PV Modul	Solar	20/12/2016	0.70
95.	Ecosensa Technologies Sdn. Bhd.	Lot 561, Mukim Jeli, Daerah Jeli, 17700 Kelantan.	PV Modul	Solar	13/11/2015	0.10
96.	EH Solar Farm Sdn. Bhd.	Lot 999 (40), Mukim Bandar Pokok Sena, Daerah Pokok Sena, 06400 Kedah.	PV Modul	Solar	13/11/2015	1.00
97.	Elegant Group Sdn. Bhd.	Sebahagian Lot PT 303, Mukim Damansara, Daerah Petaling Jaya, 47620 Selangor.	PV Modul	Solar	15/1/2015	0.14
98.	Emerald Esteem Sdn. Bhd.	Sebahagian PT 230, Mukim Bandar Sultan Suleiman, 42000 Klang, Selangor.	PV Modul	Solar	10/6/2013	0.99

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99.	Energenetic Sdn. Bhd.	Lot PT 12681 Mukim Bandar Sri Sendayan Daerah Seremban 71900 Negeri Sembilan.	PV Modul	Solar	21/1/2016	0.43
100.	Ennesa Power Sdn. Bhd.	Sebahagian Lot PT13854 Mukim Petaling Daerah Petaling, 47100 Selangor.	PV Modul	Solar	29/11/2016	1.00
101.	Epic Solartech Sdn. Bhd.	Lot 7878 Mukim Bukit Raja Daerah Petaling 40000 Selangor.	PV Modul	Solar	21/1/2016	0.30
102.	Equity Global Stocks Sdn. Bhd.	Lot 1926, Mukim Tangkak Daerah Tangkak 84900 Johor.	PV Modul	Solar	3/12/2015	0.43
103.	Evergreen Goldyear Sdn. Bhd.	Sebahagian Lot PT 4244, Mukim Kapar, Daerah Klang 42000 Selangor.	PV Modul	Solar	18/2/2014	0.50
104.	Everise Taskforce Sdn. Bhd.	Lot 3, Jalan Keluli 15/16, eksyen 15, Bandar Shah Alam, Daerah Petaling, 40200 Selangor.	PV Modul	Solar	14/11/2014	0.43
105.	EVN Vision Sdn. Bhd.	Lot 1552, Mukim 13, Daerah Seberang Perai Utara, 13800 Pulau Pinang.	PV Modul	Solar	16/3/2016	1.00
106.	Exotic Access Sdn. Bhd.	Lot PT 4180, Hs(D) 6214, Mukim Kapar, Selat Kelang Utara, 42000 Selangor.	PV Modul	Solar	13/8/2012	0.50
107.	Fairview Equity Project Sdn. Bhd.	Lot 5193, 5194, 5195, 5196 Dan 5197, Mukim Kluang, Daerah Kluang, 86000 Johor	PV Modul	Solar	31/10/2016	1.00
108.	Fairview Equity Project Sdn. Bhd.	Sebahagian No. Lot 5193, 5194, 5195, 5196, 5197, Mukim Kluang, 86000 Daerah Kluang, Johor.	PV Modul	Solar	4/12/2014	1.00
109.	Feedimo Sdn. Bhd.	Sebahagian Lot 625 & 626, Mukim 12, Daerah Seberang Perai Tengah, 14000 Pulau Pinang	PV Modul	Solar	29/9/2016	0.18
110.	Fitent Sdn. Bhd.	Lot 300645, Mukim Sungai Terap, 31000 Daerah Kinta, Perak.	PV Modul	Solar	23/12/2015	0.43
111.	Fortune 11 Sdn. Bhd.	No. Lot PT98, Mukim Labu, Daerah Sepang, 64000 Selangor.	PV Modul	Solar	4/1/2013	5.00
112.	Gading Kencana Sdn. Bhd.	Sebahagian Lot 4661 Dan 4664, Mukim Ayer Panas, Daerah Jasin, Melaka.	PV Modul	Solar	9/4/2014	5.00
113.	Gading Kencana Sdn. Bhd.	Sebahagian Lot 4661 Dan 4664, Mukim Ayer Panas, Daerah Jasin, Melaka.	PV Modul	Solar	9/4/2014	3.00
114.	Gaya Dunia Sdn. Bhd. (Fasa I - Solar)	Tapak Pelupusan Bukit Palong, Lot No. 4730, Mukim Lukut, Daerah Port Dickson, 71000 Negeri Sembilan.	PV Modul	Solar	15/2/2013	3.00
115.	Gen Master Manufacturing Sdn. Bhd.	Lot PT214903, Mukim Sungai Raia, Daerah Kinta, 31300 Perak.	PV Modul	Solar	23/12/2015	0.18
116.	General Environmental Solution Sdn. Bhd.	Sebahagian Lot 1997 Mukim Tanjong Minyak Daerah Melaka Tengah 75260 Melaka.	PV Modul	Solar	28/1/2015	0.17
117.	Genetic Solar Sdn. Bhd.	Sebahagian Lot Hs (D) 203820, PT 7498, Mukim Sungai Raya, Daerah Kinta, 31300 Perak.	PV Modul	Solar	28/12/2015	1.00
118.	Getsol Sdn. Bhd.	Universiti Malaysia Perlis, Lot 20265, Mukim Padang Siding, Daerah Arau, 02600 Perlis.	PV Modul	Solar	4/9/2015	1.00
119.	GF Technology Sdn. Bhd.	Sebahagian No. Lot 16041 (Plot 108) Mukim 12, Daerah Barat Daya 11900 Pulau Pinang.	PV Modul	Solar	21/1/2015	0.33

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120.	Goldust Growth Sdn. Bhd.	Lot PT 249 Seksyen 32, Mukim Bandar Petaling Jaya, Daerah Petaling, 46100 Selangor.	PV Modul	Solar	8/11/2016	0.43
121.	Green Catalyst Sdn. Bhd.	Sebahagian Lot 7681, Mukim Glami Lemi, Daerah Jelebu, 71650 Negeri Sembilan	PV Modul	Solar	31/10/2016	1.00
122.	Gubahan Ceria Sdn. Bhd.	Sebahagian No. Lot Hs(D) 10045, PT 3980, Mukim Gemas, Daerah Tampin, 73400 Negeri Sembilan.	PV Modul	Solar	25/11/2013	4.50
123.	Hartamas Mentari Sdn. Bhd.	Lot 8, Mukim Pekan Puchong Perdana, Daerah Petaling, 47100 Selangor.	PV Modul	Solar	9/4/2014	0.50
124.	HBH Global Energy Sdn. Bhd.	Sebahagian Lot 20159 Jalan Guar Nangka Mata Ayer Mukim Padang Siding Daerah Perlis 02500 Perlis.	PV Modul	Solar	2/4/2014	0.50
125.	Herbalnet (Malaysia) Sdn. Bhd.	Sebahagian Lot 52 & 53 Bandar Sungai Petani Daerah Kuala Muda 08000 Kedah.	PV Modul	Solar	2/11/2016	0.43
126.	HBH Global Energy Sdn. Bhd.	Lot 58 Mukim Kelemak Daerah Alor Gajah, 78000 Alor Gajah, Melaka.	PV Modul	Solar	2/4/2014	0.17
127.	Herbalnet (Malaysia) Sdn. Bhd.	Lot 61771 Mukim Bandar Glenmarie Daerah Petaling 40150 Selangor	PV Modul	Solar	27/12/2016	0.41
128.	Hong Seng Motor Sdn. Bhd.	Lot 3420, Mukim 16, Daerah Seberang Perai Utara, 13800 Pulau Pinang.	PV Modul	Solar	2/3/2015	0.17
129.	Hong Seng Power Sdn. Bhd.	Sebahagian Lot 10088, Mukim 16 Daerah Seberang Perai Utara 13800 Butterworth Pulau Pinang	PV Modul	Solar	28/11/2016	0.43
130.	IB Sofa Sdn. Bhd.	Lot 23792, Pekan Semenyih, 43500 Daerah Ulu Langat, Selangor.	PV Modul	Solar	5/3/2015	0.18
131.	Ikatan Hemat Sdn. Bhd.	Lot 239, Mukim Mentakab, Daerah Temerloh, 28400 Temerloh, Pahang.	PV Modul	Solar	13/11/2015	0.43
132.	Indawan Enterprise Sdn. Bhd.	Sebahagian No. Lot 2772, Bandar Jitra, Kubang Pasu, Kedah.	PV Modul	Solar	2/11/2016	0.43
133.	Infra Masyhur Sdn. Bhd.	Lot 47946, Mukim Dengkil, 63300 Daerah Sepang, Selangor.	PV Modul	Solar	30/12/2013	0.34
134.	Integrate Solar Farm Sdn. Bhd.	Sebahagian Lot 3123663 Mukim Sungai Raya 31300 Daerah Kinta Perak.	PV Modul	Solar	21/1/2015	0.50
135.	Integrated Logistics Solutions Sdn. Bhd.	Sebahagian Lot PT 678 Jalan Padang Tembak, Pengkalan Chepa, Mukim Panchor, Daerah Kota Bharu, 16100 Kelantan.	PV Modul	Solar	29/9/2016	1.00
136.	Integrated Logistics Solutions Sdn. Bhd.	Lot PT 599 Pekan Hicom 40400 Daerah Petaling Selangor.	PV Modul	Solar	19/3/2015	0.43
137.	Ire-Tex Packaging Sdn. Bhd.	Lot Plot 49 Bandar Kulim Daerah Kulim, 09000 Kedah	PV Modul	Solar	1/12/2016	1.00
138.	IRM Solar Sdn. Bhd.	Lot 540, 541, 542, 552 & 553, Mukim Titi Tinggi, Daerah Kangar, 02100 Perlis.	PV Modul	Solar	30/10/2014	5.00
139.	Iskandar Regional Development Authority (Irda)	No. Lot PTD 124161, Mukim Pulai, Daerah Johor Bahru, 79200 Johor.	PV Modul	Solar	14/10/2013	0.21
140.	Ivory Dazzle Sdn. Bhd.	Sebahagian Lot PT 17562, Hs(D) 43148, Mukim Klang, Daerah Klang, 40350 Selangor.	PV Modul	Solar	10/6/2013	0.99
141.	Jayadev A/L K.K. Pillai	Sebahagian Lot PT2421, PT2422 Mukim Semarak, Tok Bali, Daerah Pasir Putih 46400 Kelantan.	PV Modul	Solar	13/11/2013	1.00

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142.	Jefi Aquatech Respurces Sdn. Bhd.	Plot 314A (PT 988), Mukim 13, Daerah Seberang Prai Tengah, 14100 Pulau Pinang.	PV Modul	Solar	10/6/2013	0.18
143.	Jishan Pack Sdn. Bhd.	Lot 4281, Jalan Bukit Panchor, Mukim 07, Daerah Seberang Prai Selatan, 14300 Pulau Pinang.	PV Modul	Solar	25/9/2013	0.18
144.	Justpack Sdn. Bhd.	Lot 203660 Mukim Hulu Kinta Daerah Kinta 31560 Perak	PV Modul	Solar	27/12/2016	0.18
145.	K.J. Hock Hin Sdn. Bhd.	Sebahagian Lot PT 4093, Pulau Jeragan, Mukim Bandar Alor Setar, Daerah Kota Setar, 05150 Kedah.	PV Modul	Solar	9/9/2016	0.28
146.	Kandis Energy Solaris Sdn. Bhd.	Sebahagian Lot PT 8281 Kg Gong Nibong Hilir Mukim Telong, Daerah Jajahan Bachok, 16070 Kelantan.	PV Modul	Solar	22/11/2016	0.18
147.	Kayangan Megajaya Sdn. Bhd.	Lot No. 606, Seksyen 16, Mukim Shah Alam, 40000 Daerah Petaling, Selangor.	PV Modul	Solar	4/12/2012	0.50
148.	Kayel Rubber Products Sdn. Bhd.	Lot 395, Lorong Perusahaan 8, Kawasan Perusahaan Perai, 13600 Perai, Pulau Pinang.	PV Modul	Solar	20/11/2015	0.41
149.	Kemuning Sumikin Bussan Sdn. Bhd.	No. Lot 793, Mukim Telok Panglima Garang, Daerah Kuala Langat, 42600 Selangor.	PV Modul	Solar	12/12/2012	1.01
150.	Kimmark Manufacturing Sdn. Bhd.	Lot 1808, 12 1/2 Mile Sungei Besi Cheras Road, Pekan Ceras, 43300 Daerah Hulu Langat, Selangor.	PV Modul	Solar	19/10/2015	0.42
151.	Klasik Aktif Sdn. Bhd.	Lot 2485 (PT 2693), Mukim 01, Daerah Seberang Perai Tengah, 13600 Pulau Pinang.	PV Modul	Solar	24/12/2013	0.18
152.	Kombinasi Bumi Solar Sdn. Bhd.	Sebahagian Lot PT 57355 (HSD 57947), Mukim Klang, Daerah Klang, Selangor.	PV Modul	Solar	19/2/2014	0.31
153.	Kombinasi Bumi Solar Sdn. Bhd.	Lot 2493, Sungai Jarom, Mukim Telok Panglima Garang, 42700 Kuala Langat, Selangor.	PV Modul	Solar	11/8/2014	1.01
154.	Komitmen Mantap Sdn. Bhd.	Sebahagian Lot PT 952, Mukim Kubang Ketam, 16150 Pasir Mas, Kelantan.	PV Modul	Solar	19/2/2014	2.00
155.	Komitmen Mantap Sdn. Bhd.	Lot PT 954, Mukim Kubang Ketam, Daerah Kuala Lemal, 16150 Pasir Mas, Kelantan.	PV Modul	Solar	2/4/2014	2.00
156.	Kompass Murni Sdn. Bhd.	No. Lot 2000, Mukim Jorak, Daerah Muar, 84000 Johor.	PV Modul	Solar	7/9/2015	1.00
157.	Kuala Berang Power Solution Sdn. Bhd.	Sebahagian Lot PT13251 Dan PT 13250, Mukim Kuala Berang, Daerah Hulu Terengganu, 21700 Terengganu.	PV Modul	Solar	29/12/2015	1.00
158.	Kualiti Alam Sdn. Bhd.	Lot 6638, Mukim Jimah, 71960 Daerah Port Dickson, Negeri Sembilan.	PV Modul	Solar	1/7/2014	0.15
159.	KUB-Berjaya Energy Sdn. Bhd.	No. Lot 25, 36 Dan 37, Mukim Sungai Tinggi, Daerah Hulu Selangor, 40400 Selangor.	PV Modul	Solar	14/12/2012	0.13
160.	Kumpulan Melaka Berhad (Fasa I)	Sebahagian Lot PT 205 (Lot 1590), PT 206 (Lot 1591) Dan Pt 207 (Lot 1592), Sungai Petai, Alor Gajah, 76100 Melaka.	PV Modul	Solar	15/5/2013	1.30
161.	Kumpulan Melaka Berhad (Fasa II)	Sebahagian PT 203 (Lot 1588), Pt 204 (Lot 1589) Dan Sebahagian Pt 205 (Lot 1590), Sungai Petai, Alor Gajah, 76100 Melaka.	PV Modul	Solar	15/5/2013	1.22

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162.	Kumpulan Melaka Berhad (Fasa III)	Lot PT 193 (Lot 1528), PT 194 (Lot 1529) Dan Sebahagian PT 203 (Lot 1588), Sungai Petai, Alor Gajah, 76100 Melaka.	PV Modul	Solar	15/5/2013	2.48
163.	Kurnia Majuria Sdn. Bhd.	Sebahagian Lot PT 4244, Mukim Kapar, Daerah Klang, 42000 Selangor.	PV Modul	Solar	18/2/2014	0.50
164.	Leaf Solar Sdn. Bhd.	Sebahagian Lot PT 2486, Mukim Bandar Kulim, Daerah Kulim, 09000 Kedah.	PV Modul	Solar	2/11/2016	0.43
165.	Lembaga Pengelola SJKC Sungai Way	Lot 5150, Jln SS 9A/1, Seri Setia, 47300 Petaling Jaya, Selangor.	PV Modul	Solar	4/12/2014	0.18
166.	Lembaga Pengelola SMJK Katholik Petaling Jaya	Sebahagian HSD 175755, Bandar Petaling Jaya 46000 Daerah Petaling, Selangor.	PV Modul	Solar	3/12/2013	0.18
167.	Lembaga Pengurus SJK (C) Yuk Chai	Sebahagian Lot PT 1885, Mukim Sungai Buloh, Daerah Petaling, 47301 Selangor.	PV Modul	Solar	27/1/2016	0.11
168.	Leong Bee & Soo Bee Sdn. Bhd.	Lot 5300, Mukim 01 13600 Daerah Seberang Perai Tengah Pulau Pinang.	PV Modul	Solar	19/2/2014	0.15
169.	Leong Bee & Soo Bee Sdn. Bhd.	Lot 143 & Lot 145, Seksyen 11E, Bandar George Town Daerah Timur Laut 10300 George Town, Pulau Pinang.	PV Modul	Solar	2/3/2015	0.18
170.	LGH Construction Sdn. Bhd.	Lot 707, 141, 142 Mukim Bandar Kuala Kedah Daerah Kota Setar, 06600 Kedah.	PV Modul	Solar	28/12/2015	0.43
171.	Lim Choo Soo	PT6424 & PT6425, Jalan Tanjung Minyak, Mukim Cheng, 75250 Melaka Pindah, Melaka.	PV Modul	Solar	28/11/2013	0.95
172.	Lim Seng Plastic Sdn. Bhd.	Sebahagian Lot 203381, 203382, 203383, 203384 Dan 189654, Hulu Kinta, Daerah Kinta, 31500 Perak.	PV Modul	Solar	4/10/2016	0.18
173.	Macglo Steel Service Centre Sdn. Bhd.	Lot 3801 & Lot 104015, Batu 6 1/4, Jalan Klinik, Seksyen 32, Bukit Kemuning, 40460 Shah Alam, Selangor.	PV Modul	Solar	2/7/2012	0.47
174.	Mahendran Surya Innovations Sdn. Bhd.	Lot 830, Mukim Batu Daerah Gombak 47000 Selangor	PV Modul	Solar	29/12/2016	0.42
175.	Majuperak Energy Resources Sdn. Bhd.	Sebahagian Lot No. 312366, Mukim Sungai Raya Daerah Kinta, 31600 Perak.	PV Modul	Solar	20/1/2015	0.50
176.	Majuperak Energy Resources Sdn. Bhd.	Sebahagian Lot 312366 Mukim Sungai Raya Daerah Kinta 31600 Perak.	PV Modul	Solar	20/1/2015	0.50
177.	Malaysian Green Technology Corporation	No. 2, Jalan 9/10, Persiaran Usahawan, Seksyen 9, Bandar Baru Bangi, 43650 Kajang, Selangor.	PV Modul	Solar	29/2/2008	0.09
178.	Mara Incorporated Sdn. Bhd.	Lot 003385, Mukim Kampung Raja, Daerah Besut, 22200 Terengganu.	PV Modul	Solar	30/10/2014	0.18
179.	Maran Road Sawmill Sdn. Bhd.	Lot 3887, Mukim Perak, Daerah Temerloh, 28000 Pahang.	PV Modul	Solar	19/2/2014	0.50
180.	Matahari Kencana Sdn. Bhd.	Lot 3841-A, Mukim Hulu Bernam Timor, Daerah Batang Padang, 35950 Tanjung Malim, Perak.	PV Modul	Solar	29/12/2014	1.00
181.	Matahari Suria Sdn. Bhd.	Sebahagian Lot 4582, Mukim Setapak, Kuala Lumpur, 54100 Kuala Lumpur.	PV Modul	Solar	2/11/2016	1.00

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182.	Maxgreen Energy Sdn. Bhd. (Formerly known as Ausscar Group Sdn. Bhd.)	Sebahagian Lot PT 30506, Mukim Bandar Sungai Petani, Daerah Kuala Muda, 08000 Kedah.	PV Modul	Solar	5/1/2016	1.00
183.	Maximum Progress Sdn. Bhd.	Lot PT2121, Mukim Bandar Shah Alam, Daerah Petaling, 40200 Selangor.	PV Modul	Solar	9/10/2015	0.43
184.	Metex Steel Sdn. Bhd.	Lot 19033, 19034,19035 Dan19055, Mukim Setul, Daerah Seremban, 71800 Negeri Sembilan.	PV Modul	Solar	13/11/2015	1.00
185.	Micron (M) Sdn. Bhd.	Sebahagian Lot 38172, Mukim Pekan Baru Hicom, Daerah Petaling, 40000 Selangor.	PV Modul	Solar	31/10/2016	0.18
186.	Micron Concept Engineering Sdn. Bhd.	Lot PT 2, Seksyen 16 Bandar Shah Alam Daerah Petaling, 40200 Selangor.	PV Modul	Solar	3/12/2015	0.18
187.	MIE Corporate Holdings Sdn. Bhd.	No. Lot 39536 Mukim Petaling 47100 Puchong	PV Modul	Solar	29/12/2014	0.20
188.	MIE Corporate Holdings Sdn. Bhd.	Sebahagian Lot PT 13662, Mukim Kertih, Daerah Kemaman, 24300 Terengganu.	PV Modul	Solar	31/10/2016	1.00
189.	Milleon Extruder Sdn. Bhd.	Lot 946, Sungei Chu, Mukim Serendah, 48000 Daerah Hulu Selangor, Selangor	PV Modul	Solar	29/12/2014	0.50
190.	Minda Bumijaya Sdn. Bhd.	Sebahagian Lot PT 57351 Mukim Klang 40460 Klang	PV Modul	Solar	16/11/2015	0.43
191.	Mitsutoyo Marketing Sdn. Bhd.	Lot PT 16035, Mukim Tangkak, Daerah Ledang, 84900 Johor.	PV Modul	Solar	5/3/2015	0.40
192.	Modern Oriental Sdn. Bhd.	Sebahagian Pt 10 Dan Lot 541 Mukim 13 Seberang Perai Tengah 14000 Seberang Prai	PV Modul	Solar	16/11/2015	0.43
193.	MP Solar Energy Sdn. Bhd.	No. Lot 312366, Mukim Simpang Pulai Daerah Kinta 31300 Perak.	PV Modul	Solar	20/1/2015	0.50
194.	Mujur Satria Sdn. Bhd.	Sebahagian Lot 17562, Mukim Klang, Daerah Klang, 40350 Selangor.	PV Modul	Solar	13/8/2012	0.99
195.	Munsang Plantation Sdn. Bhd.	Lot 216444 Kawasan Perindustrian Pengkalan 2 Pusing 31500	PV Modul	Solar	2/3/2015	1.00
196.	MyWindow Portal Sdn. Bhd.	Lot 2114, Batu 55, Mukim Jabi, 22000 Daerah Besut, Terengganu.	PV Modul	Solar	8/1/2015	1.00
197.	Nationgate Solution (M) Sdn. Bhd.	Sebahagian No. Pt76, Mukim 01, 13600 Daerah Seberang Prai Tengah, Pulau Pinang.	PV Modul	Solar	23/11/2016	0.18
198.	New Hoong Fatt Auto Supplies Sdn. Bhd.	Sebahagian Lot 16474 Mukim Batu Kuala Lumpur 51200 Kuala Lumpur	PV Modul	Solar	2/4/2014	0.18
199.	Ngai Cheong Metal Industries Sdn. Bhd.	Lot 4072, Taman Perindustrian Meranti Perdana, Mukim Dengkil, Dengkil, 43800 Selangor.	PV Modul	Solar	21/1/2016	0.18
200.	Novel Energy Sdn. Bhd.	Sebahagian Lot 22205 Mukim Klang Daerah Klang Selangor.	PV Modul	Solar	23/1/2015	0.35
201.	Nyloc Fasteners Sdn. Bhd.	16503 Batu Kuala Lumpur 51200	PV Modul	Solar	9/1/2015	0.18
202.	Ong Ah Hwa	Lot 74369 Mukim Kuala Kuantan Daerah Kuantan 26300 Pahang.	PV Modul	Solar	28/2/2013	1.00
203.	Onostatic Sdn. Bhd.	Sebahagian Lot PT 90869, Mukim Klang, Daerah Klang, 42900 Selangor.	PV Modul	Solar	26/9/2016	0.16
204.	Oryza Tech Sdn. Bhd.	Sebahagian Lot PT 755, Mukim Bandar Alor Setar, Daerah Kota Setar, 05150 Alor Setar, Kedah.	PV Modul	Solar	9/9/2016	0.27

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205.	Oto Vending Sdn. Bhd.	Lot 31080, Mukim 14, Seberang Perai Tengah, 14000 Pulau Pinang.	PV Modul	Solar	16/11/2015	0.43
206.	Outreach Green Sdn. Bhd.	Sebahagian Lot 20159, Jalan Guar Nangka Mata Ayer, Mukim Padang Siding, Daerah Perlis, 02500 Perlis.	PV Modul	Solar	2/4/2014	0.50
207.	Outreach Green Sdn. Bhd.	Sebahagian Lot 20159, Jalan Guar Nangka, Mata Ayer, Mukim Padang Siding, Daerah Perlis, 02500 Perlis	PV Modul	Solar	2/4/2014	0.50
208.	Pantas Lestari Sdn. Bhd.	PT 17562, Mukim Klang, Daerah Klang, 40350 Selangor.	PV Modul	Solar	19/2/2014	0.43
209.	Pedoman Sentosa Sdn. Bhd.	Sebahagian Lot 56 Mukim Mergong, Daerah Kota Setar, 05150 Kedah	PV Modul	Solar	14/11/2016	0.17
210.	Pembinaan Eastern Aluminium Sdn. Bhd.	Lot PTD 102958, Mukim Senai, 81400 Daerah Kulaijaya, Johor.	PV Modul	Solar	5/3/2015	0.43
211.	PEPS-JV (M) Sdn. Bhd.	Lot 1403, 1406 & 1409, Batu 29, Jalan Kuala Kubu, Muki Hulu Yam, 44300 Daerah Hulu Selangor, Selangor.	PV Modul	Solar	10/6/2013	2.00
212.	Perbadanan Memajukan Iktisad Negeri Terengganu	Pulau Kapas, Mukim Rusila, Daerah Marang, 21600 Terengganu.	PV Modul	Solar	1/6/2007	0.45
213.	Perpetual Ingenuity Sdn. Bhd.	No. Lot 6675 Mukim Sungei Baru Tengah Daerah Alor Gajah Melaka	PV Modul	Solar	7/10/2015	1.00
214.	Persistcom Sdn. Bhd.	Lot 6369 Mukim Batang Padang Batang Padang 35000	PV Modul	Solar	29/12/2015	1.00
215.	Planet Sonata Sdn. Bhd.	Lot 5369, HSD 42086 Mukim 01 Daerah Seberang Perai Tengah 13700 Seberang Prai	PV Modul	Solar	29/12/2014	0.11
216.	Powerlator Sdn. Bhd.	Lot 22205, Mukim Klang Daerah Klang 40400 Selangor.	PV Modul	Solar	21/1/2016	0.43
217.	PS Green Energy Sdn. Bhd.	No. Lot 3431 Mukim Kuala Berang 21700 Hulu Terengganu	PV Modul	Solar	29/12/2015	1.00
218.	PSJ Transport Sdn. Bhd.	Sebahagian No. Lot 1675 Mukim 14, Seberang Perai Tengah 14000 Pulau Pinang.	PV Modul	Solar	14/11/2016	0.43
219.	Pusat Dialisis Marjina Sdn. Bhd.	Sebahagian Lot PT 2299, Mukim Gajah Mati, Daerah Pokok Sena, 06400 Kedah.	PV Modul	Solar	14/11/2016	0.18
220.	Qube Solar System Sdn. Bhd.	Sebahagian Lot 457 Mukim 12 Daerah Seberang Perai Selatan 14200 Seberang Prai Pulau Pinang	PV Modul	Solar	8/11/2016	0.43
221.	Ralco Compounding Sdn. Bhd.	Sebahagian Lot 758 Mukim Nilai, Daerah Seremban, 71800 Negeri Sembilan.	PV Modul	Solar	22/11/2016	0.43
222.	Reko Heights Development Sdn. Bhd.	Sebahagian Lot 14990, Mukim Semenyih, Daerah Ulu Langat, 43000 Selangor	PV Modul	Solar	8/11/2016	0.43
223.	Rentak Raya Sdn. Bhd.	Tapak Pelupusan Rimba Terjun, Lot PTD 12068, Mukim Rimba Terjun, 82000 Daerah Pontian, Johor.	PV Modul	Solar	22/11/2012	2.00
224.	Revenue Vantage Sdn. Bhd.	Sebahagian Lot 4564 Mukim Kuala Perlis Daerah Kangar 02000 Perlis.	PV Modul	Solar	20/1/2015	1.00
225.	Revenue Vantage Sdn. Bhd.	Sebahagian Lot 4564 Mukim Kuala Perlis Daerah Kangar 02000 Perlis.	PV Modul	Solar	20/1/2015	0.08
226.	Revision Solar Sdn. Bhd.	Lot 2584 (Pt 3195), Mukim 01Daerah Seberang Perai Tengah 13600 Pulau Pinang.	PV Modul	Solar	24/12/2013	0.18
227.	Rovski Industries Sdn. Bhd.	Lot 561, Sungai Penaga Mukim Damansara, Daerah Petaling 47610 Subang Jaya	PV Modul	Solar	21/1/2014	0.18

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228.	Rumpun Tiara Development Sdn. Bhd.	24437 Bera Triang 28200	PV Modul	Solar	23/12/2015	0.10
229.	Sage Majestic Sdn. Bhd.	Lot 23570, Mukim Dengkil, Daerah Sepang, 63000 Selangor.	PV Modul	Solar	2/12/2014	0.18
230.	Sai Kim Enterprise Sdn. Bhd.	Pt11175 Jalan Parit 5, Sekinchan Sabak Bernam 45400	PV Modul	Solar	18/11/2015	1.00
231.	Saluran Megajaya Sdn. Bhd.	Sebahagian Lot PT 4213, Mukim Kapar, Daerah Klang, 42000 Selangor.	PV Modul	Solar	14/11/2016	0.43
232.	Saujana Nagamas Sdn. Bhd.	Lot 626 Dan 627, Jalan Gudang 16/9, Seksyen 16, 40000 Shah Alam, Selangor.	PV Modul	Solar	13/8/2012	0.99
233.	See Hau Global Sdn. Bhd.	Sebahagian Lot 184, Mukim Plentong, 81800 Daerah Johor Bahru, Johor.	PV Modul	Solar	8/1/2015	0.18
234.	Selasih Mentari Sdn. Bhd.	Sebahagian No. Lot 4324, Mukim Rantau, Daerah Seremban, 71200 Negeri Sembilan.	PV Modul	Solar	22/11/2013	2.00
235.	Selasih Mentari Sdn. Bhd.	Sebahagian No. Lot 4324, Mukim Rantau, Daerah Seremban, 71200 Negeri Sembilan.	PV Modul	Solar	30/12/2013	2.00
236.	Selasih Mentari Sdn. Bhd.	Sebahagian No. Lot 4324, Mukim Rantau, Daerah Seremban, 71200 Negeri Sembilan.	PV Modul	Solar	22/11/2013	1.30
237.	Sendang Jaya Sdn. Bhd.	Lot 11022 Mukim Pancang Bendena Sabak Bernam	PV Modul	Solar	21/12/2015	1.00
238.	Setanding Estetika Sdn. Bhd.	Lot 1118 Mukim Hulu Sungai Johor Daerah Kota Tinggi 81900 Johor	PV Modul	Solar	27/12/2016	1.00
239.	Shah Alam Auto Parts Sdn. Bhd.	Lot 339, Mukim Kandang, 75460 Melaka Tengah, Melaka Bandaraya Bersejarah	PV Modul	Solar	29/12/2015	0.18
240.	Shaw & Sons (Kuala Lumpur) Sdn. Bhd.	Sebahagian Lot 40734, Mukim Bandar Klang, Daerah Klang, 41400 Selangor	PV Modul	Solar	19/2/2014	0.30
241.	Shea Fatt Hardware (M) Sdn. Bhd.	Sebahagian PTD 1504 Mukim Sungai Terap Daerah Muar, 84300 Johor.	PV Modul	Solar	23/11/2016	0.18
242.	Shen Yong Engineering Works Sdn. Bhd.	3910 & 3905 Tanjong Minyak Melaka Tengah 75250	PV Modul	Solar	9/7/2015	0.43
243.	Shen Yong Engineering Works Sdn. Bhd.	Lot 3910, Mukim Tanjong Minyak, Daerah Melaka Tengah, 75250 Melaka.	PV Modul	Solar	2/12/2014	0.43
244.	Silverstar Pavilion Sdn. Bhd.	Sebahagian Pt 86, Jalan KLIA1, Lapangan Terbang Antarabangsa Sepang, 64000 Sepang, Selangor.	PV Modul	Solar	24/10/2013	5.00
245.	Silverstar Pavilion Sdn. Bhd.	Sebahagian Pt 86, Jalan KLIA1, Lapangan Terbang Antarabangsa Sepang, 64000 Sepang, Selangor.	PV Modul	Solar	30/10/2013	5.00
246.	Sin Sentech Resources Sdn. Bhd.	Sebahagian Lot PT 32, Mukim 1, Daerah Seberang Perai Tengah, 13600 Pulau Pinang.	PV Modul	Solar	8/11/2016	0.18
247.	Smart Goldenway Sdn. Bhd.	No. Lot 9579 Mukim Damansara Petaling 47301 Petaling Jaya	PV Modul	Solar	23/11/2015	0.43
248.	SMF Engineering Sdn. Bhd.	Lot PT 1366 Mukim Ulu Yam Daerah Hulu Selangor 44300 Selangor	PV Modul	Solar	27/12/2016	1.00
249.	Solar Interactive Sdn. Bhd.	Sebahagian Lot 3123663 Mukim Sungai Raya Daerah Kinta 31300 Perak.	PV Modul	Solar	21/1/2015	0.50

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250.	Solar Management (Chembong) Sdn. Bhd.	Lot PT 2540, Mukim Pedas, 71300 Rembau, Negeri Sembilan.	PV Modul	Solar	24/12/2013	0.50
251.	Solar Management (Chembong) Sdn. Bhd.	Sebahagian No. Lot PT 2540 Mukim Pedas Daerah Rembau 73300 Rembau	PV Modul	Solar	9/10/2015	1.01
252.	Solar Management (Pedas One)	Lot 927, Mukim Chembong, 71300 Rembau, Negeri Sembilan,	PV Modul	Solar	15/10/2015	0.43
253.	Solar Management (Pedas Two) Sdn. Bhd.	Sebahagian No. Lot 927, Chembong, Mukim Chembong, 71300 Rembau, Negeri Sembilan.	PV Modul	Solar	2/11/2016	0.43
254.	Solar Management (Rembau) Sdn. Bhd.	Lot PT 2539, Mukim Pedas, 71300 Rembau, Negeri Sembilan	PV Modul	Solar	24/12/2013	0.50
255.	Solar System & Power Sdn. Bhd.	Site A, Sebahagian No. Lot 13854 Mukim Puchong Daerah Petaling 43400 Seri Kembangan, Selangor	PV Modul	Solar	2/3/2015	1.01
256.	Solar System & Power Sdn. Bhd.	Sebahagian Lot 13854, Mukim Puchong, Daerah Petaling, 47400 Selangor. (Site B)	PV Modul	Solar	2/3/2015	1.01
257.	Solarco Holdings Sdn. Bhd.	Sebahagian Lot A12, Mukim Kulim, Daerah Kulim, 09000 Kedah.	PV Modul	Solar	6/3/2014	0.49
258.	Solarcorp Sdn. Bhd.	Lot 11220, 11221, 11222 Dan 11223 Mukim Tanjong Minyak, 75250 Daera Melaka Tengah, Melaka.	PV Modul	Solar	28/2/2014	0.43
259.	Solplus Sdn. Bhd.	Sebahagian Lot 7499, Mukim Sungai Raya, Daerah Kinta, 31300 Perak.	PV Modul	Solar	18/2/2014	0.50
260.	Solra Sdn. Bhd.	Sebahagian Lot 222, Mukim Tawar, Daerah Baling, 09100 Kedah.	PV Modul	Solar	30/12/2013	0.48
261.	Special Universal Sdn. Bhd.	Lot 203 Kawasan Perindustrian Gebeng Mukim Sungai Karang 26080 Kuantan Pahang.	PV Modul	Solar	9/4/2014	2.50
262.	Special Universal Sdn. Bhd.	Lot 203 Kawasan Perindustrian Gebeng Mukim Sungai Karang 26080 Kuantan Pahang.	PV Modul	Solar	9/4/2014	5.00
263.	Special Universal Sdn. Bhd.	Lot 203 Kawasan Perindustrian Gebeng Mukim Sungai Karang 26080 Kuantan Pahang.	PV Modul	Solar	9/4/2014	2.50
264.	Springfield Power Sdn. Bhd.	Lot 4842, Batu 13, Jalan Sungai Besi, 43300 Cheras, Selangor	PV Modul	Solar	23/12/2015	0.35
265.	Springfield Power Sdn. Bhd	Lot 4842, Mukim Cheras, Daerah Ulu Langat, 43300 Selangor	PV Modul	Solar	8/1/2015	0.43
266.	Sri Kerdau Commodities Sdn. Bhd.	Sebahagian Pt 1353 Mukim Kerdau Daerah Temerloh 28010 Pahang	PV Modul	Solar	29/11/2016	0.27
267.	Star Media Group Berhad	Lot 64219, Mukim Damansara, 40150 Daerah Petaling, Selangor.	PV Modul	Solar	18/2/2014	0.50
268.	Starken AAC Sdn. Bhd.	Sebahagian Lot 16047, Mukim Bandar Serendah, Daerah Ulu Selangor, 42900 Selangor.	PV Modul	Solar	9/9/2016	1.00
269.	Starken AAC Sdn. Bhd.	No. Lot PT16047 Mukim Bandar Serendah, Daerah Ulu Selangor Selangor.	PV Modul	Solar	12/11/2015	0.43
270.	Sterling Fiesta Sdn. Bhd.	Sebahagian Empangan Batu Hampar @ Sepri Mukim Sepri Daerah Rembau 71300 Negeri Sembilan	PV Modul	Solar	29/12/2016	0.27
271.	Success Signet Sdn. Bhd.	Sebahagian Lot 1162 Dan 1163 Mukim Sungai Petani Kuala Muda, 08000 Kedah.	PV Modul	Solar	18/2/2014	1.75

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272.	Suluk Damai Sdn. Bhd.	Lot PT 1062 Mukim Bandar Sri Sendayan Daerah Seremban 71950 Negeri Sembilan.	PV Modul	Solar	23/1/2015	0.36
273.	Sumber Elektron Sdn. Bhd.	Sebahagian Lot PT 2540, Ladang Chembong, Mukim Pedas, Daerah Rembau, 47301 Negeri Sembilan.	PV Modul	Solar	31/10/2016	1.00
274.	Sun Seng Fatt Sdn. Bhd.	Sebahagian Lot 7498, Mukim Sungai Raya, Daerah Kinta, 31300 Perak.	PV Modul	Solar	18/2/2014	0.50
275.	Sun Seng Fatt Sdn. Bhd.	Sebahagian Lot 7498, Mukim Sungai Raya, Daerah Kinta, 31300 Perak.	PV Modul	Solar	18/2/2014	0.50
276.	Sun Solartech Sdn. Bhd.	No. Lot 2114, Blok 31, Batu 55, Mukim Jabi, Daerah Besut, 22000 Terengganu	PV Modul	Solar	8/1/2015	0.50
277.	Sunnyside Innovations Sdn. Bhd.	Sebahagian Lot 4 , Gelong Gajah, Mukim Ayer Puteh 06700 Daerah Pendang Kedah.	PV Modul	Solar	22/12/2016	1.00
278.	Sunrise Prima Sdn. Bhd.	Lot 26, Pt 56366, Mukim Klang, Daerah Klang, 40460 Selangor.	PV Modul	Solar	30/12/2013	0.42
279.	Suntech Energy Sdn. Bhd.	Sebahagian Lot 892, Mukim 15, Daerah Seberang Perai Tengah, 14000 Pulau Pinang.	PV Modul	Solar	2/11/2016	1.00
280.	Suntech Energy Sdn. Bhd.	Lot 732 Pekan Nilai 71800 Daerah Seremban Negeri Sembilan	PV Modul	Solar	8/1/2015	1.00
281.	Superspan Sdn. Bhd.	Lot 2116, Batu 9, Telok, Mukim Teluk Panglima Garang, 42500 Daerah Kuala Langat, Selangor.	PV Modul	Solar	15/1/2014	1.50
282.	Suria KLCC Sdn. Bhd.	No. Lot 170 Seksyen 58, Mukim Bandar Kuala Lumpur, Daerah Kuala Lumpur, Wilayah Persekutuan	PV Modul	Solar	16/2/2012	0.68
283.	Synergy Generated Sdn. Bhd.	3729, Kawasan Industri Sungai Bari, Hulu Nerus Setiu 22120 Terengganu	PV Modul	Solar	28/11/2014	5.00
284.	Synergy Must Sdn. Bhd.	Sebahagian Lot No. H.S(D) 07435, Pt 9, Mas Cargo Complex, Zone B Free Commercial Zone, Southern Support Zone, Kuala Lumpur International Airport, 64000 Sepang, Selangor.	PV Modul	Solar	27/2/2014	1.01
285.	Synergy Must Sdn. Bhd.	Sebahagian Lot No. H.S(D) 07435, Pt 19, Mas Cargo Complex, Zone B Free Commercial Zone, Southern Support Zone, Kuala Lumpur International Airport, 64000 Sepang, Selangor.	PV Modul	Solar	27/2/2014	1.00
286.	Synergy Solar Development Sdn. Bhd.	Plo 49, No. 23, Jalan Persiaran Teknologi, Taman Teknologi Johor, 81400 Skudai, Johor.	PV Modul	Solar	30/1/2013	1.37
287.	Synergy Solar Development Sdn. Bhd.	Plo 191, Jalan Angkasa Mas 15, Kawasan Perindustrian Tebrau II, 81100 Johor Bahru, Johor.	PV Modul	Solar	30/11/2012	0.09
288.	Synergy Solar Development Sdn. Bhd.	Plo 228, Kawasan Perindustrian Tebrau II, 81100 Johor Bahru, Johor.	PV Modul	Solar	30/11/2012	0.17
289.	Synergy Solar Development Sdn. Bhd.	Plo 742, Jalan Keluli 12, Kawasan Perindustrian Pasir Gudang, 81700 Pasir Gudang, Johor.	PV Modul	Solar	30/11/2012	0.17
290.	Synergy Solar Development Sdn. Bhd.	Sebahagian Lot PTD 37443, Jalan Perindustrian 3, Senai Industrial Park, 81400 Senai, Johor.	PV Modul	Solar	15/12/2014	0.17

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
291.	Synergy Solar Development Sdn. Bhd.	PLO 227, Kawasan Perindustrian Tebrau Ii, 81100 Johor Bahru, Johor.	PV Modul	Solar	30/11/2012	0.17
292.	Synergy Solar Development Sdn. Bhd.	Lot PTD 43009, Mukim Senai-Kulai, 81400 Daerah Johor Bahru, Johor.	PV Modul	Solar	21/4/2014	0.17
293.	Synergy Solar Development Sdn. Bhd.	Lot PTD 43022, Mukim Senai-Kulai, 81400 Daerah Johor Bahru, Johor.	PV Modul	Solar	21/4/2014	0.17
294.	Synergy Solar Development Sdn. Bhd.	Lot PTD 43023, Mukim Senai-Kulai, 81400 Daerah Johor Bahru, Johor.	PV Modul	Solar	21/4/2014	0.17
295.	Synergy Solar Dvelopment Sdn. Bhd.	Lot PTD 87634 (Plo 19), Mukim Kulai, Daerah Kulaijaya, 81400 Johor.	PV Modul	Solar	21/4/2014	0.42
296.	SYW Industry Sdn. Bhd.	Sebahagian Lot 312248 Mukim Hulu Kinta Daerah Kinta, 31450 Perak.	PV Modul	Solar	23/11/2016	0.18
297.	Tai Chong Marine Engineering Sdn. Bhd.	Sebahagian Lot 111936 Mukim Hulu Kinta Daerah Kinta, 31450 Perak.	PV Modul	Solar	8/11/2016	0.18
298.	Takumi Briquette Industries Sdn. Bhd.	Lot 18066, Blok 5 Taman Melati Tampoi Tebrau Johor Bahru 81200	PV Modul	Solar	3/12/2015	0.18
299.	Tan Cheng Siang	Di Atas Bumbung Pan Engineering Sdn. Bhd., Lot 12, Mukim Sungai Buluh, Daerah Petaling, 47810 Selangor.	PV Modul	Solar	10/7/2013	0.16
300.	Tan Chong Motor Assemblies Sdn. Bhd.	Sebahagian Lot 29120, Seksyen 20, Bandar Serendah, Daerah Ulu Selangor, 48000 Selangor.	PV Modul	Solar	9/9/2016	1.00
301.	Tan Vait Leong	Sebahagian Lot 222, Kawasan Perindustrian Kuala Ketil, Mukim Tawar, 09100 Baling, Kedah.	PV Modul	Solar	22/5/2013	0.50
302.	Tanda Hebat Sdn. Bhd.	Sebahagian Lot PT 4231, Mukim Kapar, Daerah Klang, 42000 Selangor.	PV Modul	Solar	31/10/2016	1.00
303.	Tanjung Suci Sdn. Bhd.	Sebahagian Lot 24, Mukim Bandar Petaling Jaya, Daerah Petaling, 46300 Selangor.	PV Modul	Solar	26/8/2015	0.18
304.	Temasek Cekap Sdn. Bhd.	Sebahagian No. Lot 24871, Bandar Sg. Petani, 08000 Daerah Kuala Muda, Kedah	PV Modul	Solar	2/11/2016	0.18
305.	Tenaga Ubah Sdn. Bhd.	Sebahagian Lot 13044, Mukim Sitiawan, Daerah Manjung, 32400 Perak	PV Modul	Solar	21/1/2015	0.28
306.	Tenaga Ziad Ariff Sdn. Bhd.	Sebahagian Lot 1314, Mukim Panchor, Daerah Kota Bharu 16100 Kelantan.	PV Modul	Solar	29/9/2016	0.30
307.	Teong Huat Medical Sdn. Bhd.	Sebahagian Lot No. H.S(D) 14898 Pt 2938, Mukim 11, Daerah Seberang Prai Tengah, 13700 Pulau Pinang.	PV Modul	Solar	13/11/2015	0.18
308.	Tew Peng Hwee	Sebahagian Lot 22202 (P.T. 17562), Mukim Klang, Daerah Klang, 40350 Selangor.	PV Modul	Solar	14/9/2012	0.72
309.	Thamilmukilan A/L Puspanadan	Sebahagian Pt 117, Mukim Kota Bharu, 15000 Kelantan.	PV Modul	Solar	16/4/2013	0.62
310.	The Methodist Church in Malaysia	Sebahagian Lot PT 7417, Mukim Pasir Panjang, 71050 Port Dickson, Negeri Sembilan.	PV Modul	Solar	10/6/2014	0.16
311.	Thean Hin Chan Food Industries Sdn. Bhd.	Sebahagian Lot 5o72, Mukim Titi Tinggi, Daerah Perlis, 02100 Perlis.	PV Modul	Solar	8/11/2016	0.90

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
312.	Thumbprints Utd. Sdn. Bhd.	Sebahagian Lot PT 10346 Mukim Rawang, Daerah Gombak 48000 Selangor.	PV Modul	Solar	19/2/2014	0.50
313.	Mukim Rawang, Daerah Gombak 48000 Selangor.	Sebahagian Lot PT 1627, Mukim 12, Daerah Seberang Prai Utama, 13700 Pulau Pinang.	PV Modul	Solar	31/12/2015	1.00
314.	Trisen Manufacturing Sdn. Bhd.	Sebahagian Lot 1816 Mukim Labu, Daerah Sepang 43900 Selangor.	PV Modul	Solar	19/7/2016	0.27
315.	TS Solartech Sdn. Bhd.	Sebahagian Lot 1002 Mukim 13 Seberang Perai Tengah 14000 Seberang Prai	PV Modul	Solar	31/12/2015	1.00
316.	TS Solartech Sdn. Bhd.	Sebahagian Lot PT 1002, Mukim 13, Derah Seberang Perai Tengah, 14000 Pulau Pinang.	PV Modul	Solar	25/8/2014	0.18
317.	TS Worldwide Warehousing Sdn. Bhd.	Sebahagian Lot P.T 126749, Mukim Klang, 41200 Klang, Selangor.	PV Modul	Solar	12/3/2014	0.18
318.	TSI Dinamik Sdn. Bhd.	Sebahagian Lot 2682, Kg. Binjal, Mukim Utan Aji, 01000 Kangar, Perlis	PV Modul	Solar	2/11/2016	0.27
319.	TST Machinery & Automation Sdn. Bhd.	Lot 377857 Mukim Hulu Kinta 31200 Kinta	PV Modul	Solar	18/11/2015	0.13
320.	Tuck Sun & Co (Malaysia) Sdn. Bhd.	142454 Klang Klang 42000	PV Modul	Solar	21/1/2016	0.25
321.	TVE Tenaga Sdn. Bhd.	Sebahagian Lot 1171, Jalan Kluang Batu 18, Mukim Sri Gading, 86100 Batu Pahat, Johor	PV Modul	Solar	22/11/2016	1.00
322.	Twelve Stranddna Sdn. Bhd.	No. Lot 670, Sg Bakap Mukim Seberang Perai Selatan Daerah Jawi 14200 Pulau Pinang.	PV Modul	Solar	28/1/2015	0.43
323.	TWT Hardware Sdn. Bhd.	Lot 11250, Mukim Ijok, Daerah Kuala Selangor, 42300 Selangor.	PV Modul	Solar	9/10/2015	0.43
324.	Uchi Optoelectronic (M) Sdn. Bhd.	Sebahagian Lot PT 3048, Mukim 01 Daerah Seberang Perai Tengah 13600 Pulau Pinang	PV Modul	Solar	23/11/2016	0.43
325.	Unicity Management Sdn. Bhd.	Sebahagian Lot 1299 Mukim Utan Aji 01000 Kangar	PV Modul	Solar	23/12/2015	0.18
326.	Upaya Jayamas Sdn. Bhd.	P.T. No. 249, Mukim Damansara, Daerah Petaling, 47600 Selangor.	PV Modul	Solar	30/12/2013	0.50
327.	Uptown System Sdn. Bhd.	Sebahagian Lot No. H.S(D) 07435, Pt 19, Mas Cargo Complex, Zone B Free Commercial Zone, Southern Support Zone, Kuala Lumpur International Airport, 64000 Sepang, Selangor.	PV Modul	Solar	27/2/2014	2.47
328.	Urban Aquaponics Sdn. Bhd.	Sebahagian Lot 1 (Pt 4604), Mukim Kota Setar, Daerah Kuala Kedah, 05400 Kedah.	PV Modul	Solar	30/12/2013	0.43
329.	Vafe System Sdn. Bhd.	Lot 305014 Mukim Hulu Kinta Daerah Kinta 31200 Perak	PV Modul	Solar	27/12/2016	1.00
330.	Velocity Renewable & Green Energy Tech Sdn. Bhd.	Lot PT 24091 Mukim Bandar Sungai Petani Daerah Kuala Muda 08000 Sungai Petani	PV Modul	Solar	5/10/2015	0.18
331.	Viz Urbana Sdn. Bhd.	Sebahagian Lot 15 Mukim Jelutong, Daerah Johor Bahru 79200 Johor.	PV Modul	Solar	19/2/2014	0.10
332.	Voltage Renewables Sdn. Bhd.	Sebahagian No. Lot PT 9006, Mukim Sungai Karang, Daerah Gebeng, 26080 Pahang.	PV Modul	Solar	16/10/2013	1.01
333.	Voltage Renewables Sdn. Bhd.	Sebahagian No. Lot PT 9006, Mukim Sungai Karang, Daerah Gebeng, 26080 Pahang.	PV Modul	Solar	16/10/2013	1.01

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
334.	Voltage Renewables Sdn. Bhd.	Sebahagian No. Lot PT 9006, Mukim Sungai Karang, Daerah Gebeng, 26080 Pahang.	PV Modul	Solar	16/10/2013	3.00
335.	Voltage Renewables Sdn. Bhd.	Sebahagian No. Lot PT 9006, Mukim Sungai Karang, Daerah Gebeng, Negeri Pahang.	PV Modul	Solar	16/10/2013	5.00
336.	Wangco Incorporated Sdn. Bhd.	Lot PT 11741, Mukim Damansara, Daerah Subang Jaya, 47500 Selangor.	PV Modul	Solar	5/3/2015	0.18
337.	Weng Siang Sdn. Bhd.	Lot 520, Mukim 13 Seberang Prai Tengah 13700	PV Modul	Solar	12/11/2015	0.43
338.	Wibawa Harmoni Sdn. Bhd.	Lot 632 & 633, Seksyen 16, Bandar Shah Alam, 40000 Daerah Petaling, Selangor.	PV Modul	Solar	4/12/2012	0.99
339.	WT Plastic Products Sdn. Bhd.	Sebahagian PT 50841, Mukim Kapar, Daerah Klang, 42200 Selangor.	PV Modul	Solar	26/12/2013	0.14
340.	Yanta Plastic Industry Sdn. Bhd.	Sebahagian Lot 541 Dan Lot PT10, Mukim 13, Daerah Seberang Perai Tengah, 14000 Pulau Pinang.	PV Modul	Solar	2/11/2016	0.34
341.	Yiqi Sdn. Bhd.	Lot PT 104, Pekan Baru Subang, 40100 Daerah Petaling, Selangor.	PV Modul	Solar	19/2/2014	0.18
342.	Zinklite Corporation (M) Sdn. Bhd.	Sebahagian PT 751 Mukim Bohor Daerah Langkawi 07000 Kedah.	PV Modul	Solar	29/12/2016	1.00

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) *(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)*

Jadual 12: Kapasiti dilesenkan dan penjanaan projek tenaga boleh baharu (TBB) di Semenanjung Malaysia
Table 12: Licensed capacity and generation of renewable energy (RE) projects in Peninsular Malaysia

Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
BIOJISIM *BIOMASS*	53.88	95.15
BIOGAS	49.32	94.14
HIDRO MINI *MINI HYDRO*	37.83	45.71
SOLAR	247.29	124.67
JUMLAH *TOTAL*	**388.31**	**359.67**

Nota • *Notes:*
Berdasarkan laporan yang dihantar oleh pemegang lesen setakat 5 Mac 2018. *Based on the reports submitted by the licensees as of 5 March 2018.*

Jadual 13: *Cogeneration* persendirian di Semenanjung Malaysia (lesen sah setakat 31 Disember 2016)
Table 13: Private cogeneration in Peninsular Malaysia (valid licenses as of 31 December 2016)

Bil. *No.*	Pemegang lesen *Licensee*	Negeri *State*	Tarikh mula sah lesen *License start date*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
1.	Acidchem International Sdn. Bhd.	Pulau Pinang	13/05/2015	OCGT	Gas asli *Natural gas*	6.51
2.	BASF PETRONAS Chemicals Sdn. Bhd.	Pahang	26/09/2000	Turbin stim *Steam turbine*	Gas asli *Natural gas*	27.40
3.	Biovision & Greenergy Sdn. Bhd.	Johor	22/11/2016	Turbin stim & enjin Diesel *Steam turbine & diesel engine*	Biojisim *Biomass*	6.88
4.	Central Sugars Refinery Sdn. Bhd.	Selangor	8/4/2015	Turbin stim *Steam turbine*	Gas asli *Natural gas*	14.23
5.	Gas District Cooling (Putrajaya) Sdn. Bhd.	Putrajaya	21/07/2003	Enjin Gas *Gas engine*	Gas asli *Natural gas*	10.74
6.	Gas District Cooling (Putrajaya) Sdn. Bhd.	Putrajaya	3/10/2006	CCGT	Gas asli *Natural gas*	8.00
7.	Gula Padang Terap Sdn. Bhd.	Kedah	24/11/2009	Turbin stim & enjin Diesel *Steam turbine & diesel engine*	Gas asli *Natural gas*	11.49
8.	Kaneka (Malaysia) Sdn. Bhd.	Pahang	27/08/2015	Enjin Gas *Gas engine*	Gas asli *Natural gas*	12.00
9.	Kuala Lumpur Kepong Berhad, Kilang Kelapa Sawit Kekayaan	Johor	9/3/2015	Turbin stim & enjin Diesel *Steam turbine & diesel engine*	Biojisim *Biomass*	5.53
10.	Lotte Chemical Titan (M) Sdn. Bhd.	Johor	7/11/2007	Turbin stim *Steam turbine*	Gas asli *Natural gas*	56.00
11.	Lotte Chemical Titan (M) Sdn. Bhd.	Johor	11/5/2014	CCGT	Gas asli *Natural gas*	42.60
12.	Malayan Sugar Manufacturing Company Bhd.	Pulau Pinang	31/01/2011	Turbin stim *Steam turbine*	Gas asli *Natural gas*	8.95
13.	Malaysian Newsprint Industries Sdn. Bhd.	Pahang	11/8/2000	Turbin stim *Steam turbine*	*Medium fuel oil*	79.20
14.	MSM Perlis Sdn. Bhd.	Perlis	18/10/2016	Turbin stim & enjin Diesel *Steam turbine & diesel engine*	Gas asli *Natural gas*	9.39
15.	Muda Paper Mills Sdn. Bhd.	Selangor	20/07/2006	Enjin Gas *Gas engine*	Gas asli *Natural gas*	14.40
16.	Perak-Hanjoong Simen Sdn. Bhd.	Perak	29/05/2012	Turbin stim *Steam turbine*	Sisa Industri *Industrial waste*	12.00
17.	Perwaja Steel Sdn. Bhd.	Terengganu	11/10/2011	CCGT	Gas asli *Natural gas*	9.50
18.	PETRONAS Fertilizer (Kedah) Sdn. Bhd.	Kedah	25/07/2007	Turbin stim *Steam turbine*	Gas asli *Natural gas*	18.31
19.	PETRONAS Gas Berhad	Terengganu	6/12/2012	CCGT	Gas asli *Natural gas*	25.00
20.	PETRONAS Gas Berhad	Terengganu	6/12/2012	CCGT	Gas asli *Natural gas*	25.00
21.	WRP Asia Pacific Sdn. Bhd.	Selangor	7/5/2012	Enjin Gas *Gas engine*	Gas asli *Natural gas*	8.00
22.	PETRONAS Penapisan Melaka	Melaka	11/5/2015	CCGT	Gas asli *Natural gas*	152.30
					JUMLAH *TOTAL*	**563.43**

Jadual 14: Kapasiti dilesenkan dan penjanaan *cogeneration* persendirian di Semenanjung Malaysia
Table 14: Licensed capacity and generation of private cogeneration in Peninsular Malaysia

Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
BIOJISIM *BIOMASS*	12.41	8.46
MEDIUM FUEL OIL	79.20	n/a
GAS ASLI *NATURAL GAS*	459.82	1,627.32
SISA INDUSTRI *INDUSTRIAL WASTE*	12.00	n/a
JUMLAH *TOTAL*	**563.43**	**1,635.78**

Nota • *Notes:*
1. Berdasarkan laporan yang dihantar oleh pemegang lesen setakat 5 Mac 2018 *Based on the reports submitted by the licensees as of 5 March 2018*
2. n/a Tiada laporan *Report unavailable*

Jadual 15: *Cogeneration* awam di Semenanjung Malaysia Malaysia (lesen sah setakat 31 Disember 2016)
Table 15: Public cogeneration in Peninsular Malaysia (valid licenses as of 31 December 2016)

Bil. *No.*	Pemegang lesen *Licensee*	Negeri *State*	Tarikh mula sah lesen *License start date*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
1.	Gas District Cooling (KLIA) Sdn. Bhd.	Selangor	1/1/2016	CCGT	Gas asli *Natural gas*	40.00
2.	Gas Malaysia Energy Advance Sdn. Bhd.	Pulau Pinang	16/10/2014	CCGT	Gas asli *Natural gas*	33.50
3.	Institute of Technology PETRONAS Sdn. Bhd.	Perak	3/10/2006	Enjin Gas *Gas engine*	Gas asli *Natural gas*	8.40
4.	Optimistic Organic Sdn. Bhd.	Terengganu	20/10/2011	Enjin diesel *Diesel engine*	Haba buangan proses perindustrian *Industrial process waste heat*	7.00
5.	Perstima Utility Sdn. Bhd.	Johor	27/07/2011	Enjin Gas *Gas engine*	Gas asli *Natural gas*	5.70
6.	PETRONAS Gas Berhad	Terengganu	28/05/1998	CCGT	Gas asli *Natural gas*	210.00
7.	PETRONAS Gas Berhad	Pahang	28/05/1998	CCGT	Gas asli *Natural gas*	105.00
8.	See Sen Chemical Berhad	Terengganu	17/06/2009	Enjin diesel *Diesel engine*	Haba buangan proses perindustrian *Industrial process waste heat*	6.00
9.	Shell Refining Company (FOM) Berhad	Negeri Sembilan	10/5/2009	CCGT	Gas asli *Natural gas*	35.00
					JUMLAH *TOTAL*	**450.60**

Jadual 16: Kapasiti dilesenkan dan penjanaan *cogeneration* awam di Semenanjung Malaysia
Table 16: Licensed capacity and generation of public cogeneration in Peninsular Malaysia

Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
GAS ASLI *NATURAL GAS*	437.60	2,202.22
HABA BUANGAN PROSES PERINDUSTRIAN *INDUSTRIAL PROCESS WASTE HEAT*	13.00	10.54
JUMLAH *TOTAL*	**450.60**	**2,212.76**

Nota • *Notes:*
Berdasarkan laporan yang dihantar oleh pemegang lesen setakat 5 Mac 2018 *Based on the reports submitted by the licensees as of 5 March 2018*

Jadual 17: Penjanaan persendirian kurang 5 MW di Semenanjung Malaysia

Table 17: Less-than-5 MW self generation in Peninsular Malaysia

Pejabat Kawasan ST *ST Regional Office*	Bilangan Lesen Sah shg. 31 Dis. 2016 *No. of Valid License as of 31st Dec. 2016*	Kapasiti (MW) *Capacity (MW)*	Elektrik dijana (GWj) mengikut sumber tenaga *Generated electricity by energy source (GWh)*										
			DIESEL	TANDAN SAWIT KOSONG *EMPTY FRUIT BUNCHES*	TEMPURUNG & GENTIAN KELAPA SAWIT *PALM OIL SHELL & FIBRE*	EFLUEN KILANG KELAPA SAWIT *PALM OIL MILL EFFLUENT*	HABUK KAYU *WOOD DUST*	SURIA *SUN*	HIDRO *HYDRO*	SISA SAWIT *PALM OIL WASTE*	HAMPAS PADI *PADDY HUSK*	LAIN-LAIN *OTHERS*	JUMLAH *TOTAL*
Johor	155	23.62										2.04	2.04
Kelantan & Terengganu	241	87.28	2.48	15.30									17.78
Negeri Sembilan & Melaka	142	78.68	1.00							25.69			26.69
Pahang	216	250.84	0.01	0.14		0.00	0.00						0.15
Perak	122	70.07	6.00	59.50		7.14			5.28				77.92
Pulau Pinang, Kedah & Perlis	58	60.00	0.08	0.54				0.12			0.03		0.77
Selangor, Kuala Lumpur & Putrajaya	472	188.33	1.49	0.72	0.45		0.25						2.91
Jumlah *Total*	**1,406**	**758.81**	**11.06**	**76.20**	**0.45**	**7.14**	**0.25**	**0.12**	**5.28**	**25.69**	**0.03**	**2.04**	**128.26**

Nota • *Notes:*
Data tahun 2015 *Year 2015 data*

Jadual 18: Lesen pengagih elektrik di Semenanjung Malaysia yang dikeluarkan pada tahun 2016
Table 18: Electricity distributor licences in Peninsular Malaysia issued in 2016

Bil. *No.*	Pemegang lesen & alamat perhubungan *Licensees & contact address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen *License date*
1.	**Langkah Realiti Sdn. Bhd.** Jalan Kemus, Simpang Empat 78999 Alor Gajah Melaka.	Sebahagian Lot 1613, Mukim Pegoh Daerah Alor Gajah 78000 Melaka.	4.25	07-01-2016
2.	**AEON Co. (M) Bhd.** 3rd Floor, Jusco Taman Maluri Shopping Centre, Jalan Jejaka Taman Maluri, Cheras 55100 Kuala Lumpur.	Lot 2437, Seksyen 13 Bandar Shah Alam Daerah Petaling, Selangor.	15.00	20-01-2016
3.	**Big Matrix Sdn. Bhd.** No. 6-1, Jalan PJU 5/4, Dataran Sunway Kota Damansara 47810 Petaling Jaya Selangor.	(Blok B & C) Kompleks KL Gateway Sebahagian Lot 480578 Mukim Kuala Lumpur 59200 Kuala Lumpur.	7.65	20-01-2016
4.	**Big Matrix Sdn. Bhd.** No. 6-1, Jalan PJU 5/4, Dataran Sunway Kota Damansara 47810 Petaling Jaya Selangor.	(Blok D) Kompleks KL Gateway Sebahagian Lot 480578 Mukim Kuala Lumpur 59200 Kuala Lumpur.	5.50	20-01-2016
5.	**Big Matrix Sdn. Bhd.** No. 6-1, Jalan PJU 5/4 Dataran Sunway Kota Damansara 47810 Petaling Jaya, Selangor.	(Podium) Kompleks KL Gateway Sebahagian Lot 480578 Mukim Kuala Lumpur 59200 Kuala Lumpur.	5.50	20-01-2016
6.	**TB Supply Base Sdn. Bhd.** Menara Darussalam 12, Jalan Pinang, Level 15 , 50450 Kuala Lumpur.	Jeti Pelabuhan Tok Bali Lot PT6864 Mukim Semarak Daerah Pasir Puteh 16700 Kelantan.	2.98	20-01-2016
7.	**AEON Co. (M) Bhd.** 3rd Floor, Jusco Taman Maluri Shippong Centre, Jalan Jejaka Taman Maluri, Cheras 55100 Kuala Lumpur.	AEON Klebang No. Lot 12080, Mukim Hulu Kinta Daerah Kinta 31200 Perak	9.00	20-01-2016
8.	**Iskandar Education Enterprise Sdn. Bhd.** #G-12, Blok 8 Danga Bay, Jalan Skudai 80200 Johor Bahru Johor.	Sebahagian Lot PTD 189211 Mukim Pulai Daerah Johor Bahru 79200 Johor.	1.70	27-01-2016
9.	**Gerbang Mekar Sdn. Bhd.** No. 15-1, Jalan Remia 2/KS6 Bandar Botanic 41200 Klang Selangor.	M3 Mall Lot 9670 Jalan Madrasah (Jalan 1/22A) Taman Melati, Mukim SetapakDaerah Gombak 53100 Wilayah Persekutuan Kuala Lumpur	5.10	28-01-2016
10.	**Gch Retail (M) Sdn. Bhd.** Mezzanine Floor Giant Hypermarket Shah Alam Stadium Lot 2, Persiaran Sukan, Seksyen 12 40100 Shah Alam Selangor.	Lot PT 4819, Mukim Utan Aji Daerah Kangar 01000 Perlis	1.70	02-02-2016
11.	**Ultimate Pursuit Sdn. Bhd.** No. 78, 2nd Floor Jalan SS 15/4 47500 Subang Jaya Selangor.	Lot 101253 Mukim Petaling Daerah Kuala Lumpur Wilayah Persekutuan	3.40	02-02-2016
12.	**AEON Big (M) Sdn. Bhd.** 3, Jalan SS 16/1 47500 Subang Jaya Selangor	AEON Big Ipoh Farlim No. Lot 107246, 107247, 107248 Mukim Hulu Kinta Daerah Kinta, Perak.	11.90	03-02-2016
13.	**RHB Trustees Berhad** (As Trustee for Sunway Reit- Menara Sunway) Unit 4.5, Menara Sunway Annexe Jalan Lagoon Timur, Bandar Sunway 47500 Petaling Jaya, Selangor.	Lot 61700 Bandar Sunway 47500 Daerah Petaling Selangor	5.70	12-02-2016
14.	**Winning Leap Sdn. Bhd.** 29-5 & 31-5, Metro Centre Jalan Tasik Selatan 8 Bandar Tasik Selatan 57000 Kuala Lumpur.	No. Lot 101156 Mukim Petaling Daerah Kuala Lumpur 55200 Wilayah Persekutuan Kuala Lumpur	14.45	29-02-2016
15.	**Tropicana Indah Sdn. Bhd.** Level 10-12, Tropicana City Office Tower No. 3, Jalan SS 20/27 47400 Petaling Jaya Selangor.	Kompleks Tropicana Gardens Lot 52582 & 52581 Mukim Sungai Buloh Daerah Petaling 47800 Selangor	44.20	29-02-2016

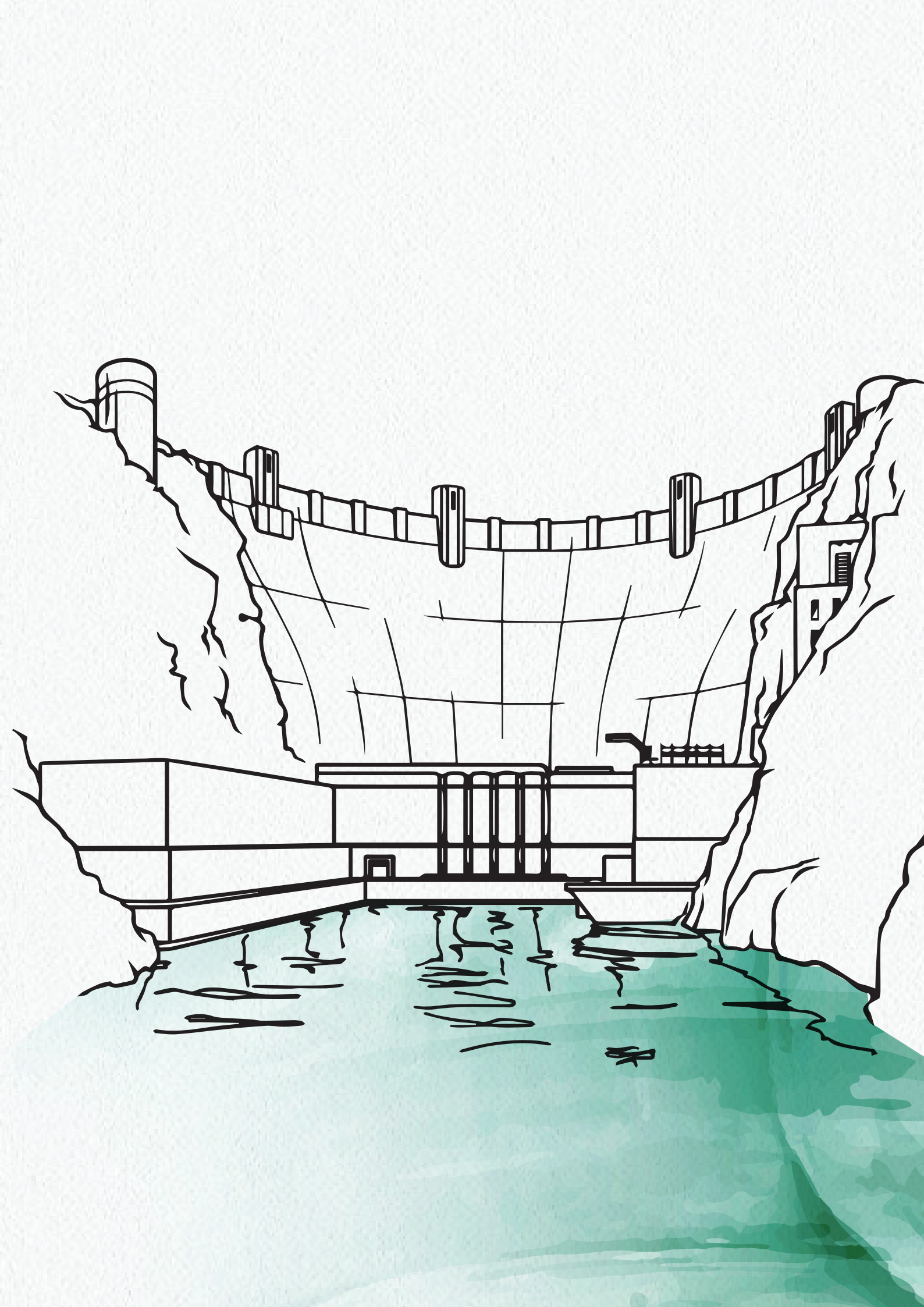
Bil. *No.*	Pemegang lesen & alamat perhubungan *Licensees & contact address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen *License date*
16.	**CSF CX Sdn. Bhd.** CSF Computer Exchange 5 (CX5) Jalan Cyberpoint 2, Cyber 12 63000 Cyberjaya Selangor.	Bangunan CSF Computer Exchange 5 (CX5), No. Lot PT 55045 Mukim Dengkil, Daerah Sepang, 63000 Selangor	44.63	26-02-2016
17.	**GCH Retail (M) Sdn. Bhd.** Giant Hypermarket Nusa Bestari – Complex Management No. 1, Jalan Nusa Bestari 7/2 Taman Nusa Bestari 81300 Johor Bahru, Johor.	Giant Hypermarket Nusa Bestari Sebahagian PT 71065 Mukim Pulai Daerah Johor Bahru 81300 Johor	3.40	01-03-2016
18.	**AEON Big (M) Sdn. Bhd.** 3, Jalan SS 16/1 47500 Subang Jaya Selangor.	AEON Big Kluang No. Lot 1284, Mukim Jalan Mersing Daerah Kluang 86000 Johor	2.55	14-03-2016
19.	**ECO Meridian Sdn. Bhd.** Setia Welcome Centre Spice, No. 108 Jalan Tun Dr. Awang 11900 Pulau Pinang.	11569, 11543 & 7481 12 Jalan Tun Dr Awang Barat Daya, 11900 Pulau Pinang.	4.25	22-04-2016
20.	**Selayang Star City Mall Sdn. Bhd.** No. 1-10 Signature Office The Boulevard, Mid Valley City Lingkaran Syed Putra 59200 Kuala Lumpur.	Lot 168, Mukim Bandar Selayang Daerah Gombak 68100 Selangor.	29.75	29-04-2016
21.	**AEON Co. (M) Bhd.** 3rd Floor, Jusco Taman Maluri Shopping Centre, Jalan Jejaka, Taman Malur Cheras 55100 Kuala Lumpur.	AEON Kota Bharu Lot PT 1886, Seksyen 17 Daerah Jajahan Kota Bharu Bandar Kota Bharu 15000 Kelantan.	15.35	06-05-2016
22.	**The University of Nottingham in Malaysia Sdn. Bhd.** Malaysia Campus Jalan Broga 43500 Semenyih Selangor.	University of Nottingham Malaysia Lot PT 14532 Mukim Semenyih Daerah Ulu Langat 43500 Selangor.	9.35	06-05-2016
23.	**Titijaya Asset Sdn. Bhd.** N-16-01, Penthouse, Level 16 First Subang, Jalan SS15/4G 47500 Subang Jaya Selangor.	Lot 7833, Mukim Damansara Daerah Petaling 47500 Selangor.	3.82	06-05-2016
24.	**Tasek Management Services Sdn. Bhd.** Suite 603-607, 6th Floor Bangunan Ang No. 1, Jalan Jeram, Taman Tasek 80200 Johor Bahru Johor.	Tasek Central Building Lot 13385 – 13435 and PTD 61016 Jalan Tun Aminah, Mukim Pulai Daerah Johor Bahru 81300 Johor.	8.50	06-05-2016
25.	**Ordinary Management Sdn. Bhd.** Lot 1323, Mukim 7, Jalan Perda Selatan Bandar Perda 14000 Bukit Mertajam Penang.	Kompleks BM City Lot 1323, Mukim 7 Jalan Perda Selatan, Daerah Seberang Perai Tengah, 14000 Pulau Pinang.	8.50	11-05-2016
26.	**PE Land (Penang) Sdn. Bhd.** The Spring Centre Management Office Lot 304, 3rd Floor, The Spring Shopping Mall Persiaran Spring 93300 Kuching Sarawak.	Design Village Premium Outlet Mall Lot 282, Mukim 13 Daerah Seberang Perai Selatan 14100 Pulau Pinang	10.20	11-05-2016
27.	**Family Mall Sdn. Bhd.** Level 2G, Menara Zenith Jalan Putra Square 6 Putra Square 25200 Kuantan Pahang.	Family Mall No. Lot PT 119944, PT 121635 & PT 57422 Jalan Tun Ismail 2, Mukim Bandar Kuantan Daerah Kuantan 25200 Pahang.	6.80	27-05-2016
28.	**Ken TTDI Sdn. Bhd.** No. 6, Jalan Datuk Sulaiman Taman Tun Dr. Ismail 60000 Kuala Lumpur.	Lot 31210 dan 31211, Mukim Kuala Lumpur Daerah Kuala Lumpur 60000 Kuala Lumpur	4.25	27-05-2016
29.	**Goodwill Division Sdn. Bhd.** No. 6, Jalan Setia Tropika 1/1 Taman Setia Tropika 81200 Johor Bahru Johor.	Lot 201004, Mukim Plentong Daerah Johor Bahru 81750 Johor.	5.10	06-06-2016
30.	**Badan Pengurusan Bersama Suntech@ Penang Cybercity** No. 1-10-3 Lintang Mayang Pasir 3 11950 Banyan Baru Pulau Pinang.	Lot 11419, Mukim 12 Daerah Barat Daya 11950 Pulau Pinang.	4.250	06-06-2016

Bil. *No.*	Pemegang lesen & alamat perhubungan *Licensees & contact address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen *License date*
31.	**Public Holdings Sdn. Bhd.** 8th Floor, Menara Public Bank No. 146, Jalan Ampang 50450 Kuala Lumpur.	Lot 59, Seksyen 57 Bandar Kuala Lumpur 50200 Wilayah Persekutuan Kuala Lumpur	6.80	07-06-2016
32.	**Venus Assets Sdn. Bhd.** Level 3, Wisma Concorde, No. 2, Jalan Tun Ismail 50250 Kuala Lumpur.	Bangunan Four Seasons Place No. Lot 230, Seksyen 58 Jalan Lumba Kuda Off Jalan Ampang 50088 Wilayah Persekutuan Kuala Lumpur.	20.40	16-06-2016
33.	**Boustead Ikano Sdn. Bhd.** Tingkat 28, Menara Boustead 69 Jalan Raja Chulan 50200 Kuala Lumpur	My Town Shopping Centre Lot 20004 Seksyen 90, Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur, 50200 Kuala Lumpur.	17.00	23-06-2016
34.	**Dk-My Properties Sdn. Bhd.** No. 4, Jalan PPU 3 Taman Perindustrian Puchong Utama 47100 Puchong, Selangor.	D-Latour Building Lot PT 294 Mukim Pekan Penaga Daerah Petaling 46150 Selangor.	7.65	19-07-2016
35.	**Serimas Ceria Sdn. Bhd.** Wisma Mustapha Kamal Menara 2, 02-G-01, Neo Cyber Lingkaran Cyber Point Barat, Cyber 12 63000 Cyberjaya Selangor.	Bangunan Star Central@ Cyberjaya Sebahagian Lot 105163 Mukim Dengkil, Daerah Sepang 63000 Selangor.	9.09	22-07-2016
36.	**JKG Tower Sdn. Bhd.** No. 32-34 Jalan Segambut 51200 Wilayah Persekutuan Kuala Lumpur.	JKG Tower Lot 1404 & 1405, Seksyen 46, Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur Wilayah Persekutuan.	5.95	01-08-2016
37.	**Sunway Forum Hotel Sdn. Bhd.** Level 3, Menara Sunway Jalan Lagoon Timur Bandar Sunway 47500 Petaling Jaya Selangor.	Sunway Forum Hotel Sebahagian Daripada Lot PT 133 Mukim Damansara Daerah Petaling 41650 Selangor.	4.25	05-08-2016
38.	**Monash University Malaysia Sdn. Bhd.** Jalan Lagoon Selatan 47500 Bandar Sunway Selangor.	Kampus Monash Universiti Malaysia Lot PT 894 Bandar Sunway Daerah Petaling 47500 Selangor.	9.18	19-08-2016
39.	**Winsome Land Development Sdn. Bhd.** Lot D-7-3 Level 9 Block D, Menara Uncang Emas, No. 85, Jalan Loke Yew, 55200 Kuala Lumpur.	Lot 255, Lorong Haji Taib 5 Daerah Gombak, Seksyen 46 Kuala Lumpur Wilayah Persekutuan Kuala Lumpur.	1.70	05-09-2016
40.	**Sime Darby Capitaland (Melawati Mall) Sdn. Bhd.**Level 10th Floor Jalan PJU 1A/7A Ara Damansara PJU 1A, Ara Damansara 47301 Petaling Jayaselangor.	Lot PT 5036, Seksyen 1 Bandar Ulu Kelang Daerah Gombak 68100 Selangor.	15.30	04-10-2016
41.	**Glo Damansara Sdn. Bhd.** Level 15, Menara Glomac Glomac Damansara, Jalan Damansara 60000 Kuala Lumpur.	Lot 73, Mukim Kuala Lumpur Daerah Kuala Lumpur 60000 Kuala Lumpur.	6.37	12-10-2016
42.	**Engtex Emerld Sdn. Bhd.** 2-10, No. 2, Level 10, Wisma Manjalara Jalan 7A/62A, Bandar Manjalara 52200 Kuala Lumpur.	Kompleks Dataran Emerald Lot PT 9488 Mukim Batu Daerah Gombak 68100 Selangor.	8.76	18-10-2016
43.	**Pertubuhan Keselamatan Sosial** Ibu Pejabat, PERKESO Kementerian Sumber Manusia Menara Perkeso, 281, Jalan Ampang 50538 Kuala Lumpur.	Bangunan PERKESO Kuala Terengganu Lot PT 3798 Bandar Kuala Terengganu Daerah Terengganu 20538 Terengganu.	1.70	21-10-2016
44.	**Gamuda GM Klang Sdn. Bhd.** Menara Gamuda, D-16-01, Block D PJ Trade Centre, No. 8, Jalan PJU 8/8A, Bandar Damansara Perdana 47820 Petaling Jaya Selangor.	Lot PT 118117 dan Lot 143099 Mukim Klang Daerah Klang 41200 Selangor.	12.58	18-11-2016
45.	**Tanjong City Centre Property Management Sdn. Bhd.** Level 29, Menara Maxis Kuala Lumpur City Centre 50088 Kuala Lumpur.	Menara Maxis Sebahagian Lot 168, Seksyen 58 Mukim Bandar Kuala Lumpur Daerah Kuala Lumpur 50088 Kuala Lumpur	10.20	22-11-2016

Bil. *No.*	Pemegang lesen & alamat perhubungan *Licensees & contact address*	Kawasan bekalan *Area of supply*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Tarikh lesen *License date*
46.	**Faithview Realty Sdn. Bhd.** Menara Faithview No. 21, Jalan KL 3/15, Taman Kota Laksamana Sek. 3 75200 Melaka.	Kondominium Kota Laksamana Jaya Lot PT 2150 Kawasan Bandar IV 75200 Daerah Melaka Tengah Melaka.	3.00	22-11-2016
47.	**Trinity Bliss Sdn. Bhd.** Suie 12.05 Level 12 , Centrepoint North Tower, Mid Valley City, Lingkaran Syed Putra 59200 Kuala Lumpur.	Lot PTD 2426 Mukim Tanjung Kupang Daerah Johor Bahru 81560 Johor.	4.08	23-11-2016
48.	**AEON Co. (M) Sdn. Bhd.** 3rd Floor, Aeon Taman Maluri Shopping Centre, Jalan Jejaka Taman Maluri, Cheras 55100 Kuala Lumpur.	JUSCO Tebrau City Shopping Centre Lot PTD 114179 Mukim Tebrau Daerah Johor Bahru 81100 Johor.	25.50	28-11-2016
49.	**WCT Hartanah Jaya Sdn. Bhd.** No. 12, Jalan Majistret U1/26 Seksyen U1, Lot 44, Hicom Glenmarie Industrial Park 40150 Shah Alam, Selangor.	Paradigm Mall, Lot 32665, Mukim Tebrau, Daerah Johor Bahru, Johor.	23.97	29-12-2016
50.	**Big Matrix Sdn. Bhd. (Block F & G)** No. 6-1, Jalan PJU 5/4, Dataran Sunway Kota Damansara, 47810 Petaling Jaya, Selangor.	Kompleks KL Gateway Sebahagian Lot 480578 Mukim Kuala Lumpur, 59200 Kuala Lumpur.	3.40	29-12-2016
51.	**Big Matrix Sdn. Bhd. (Block E)** No. 6-1, Jalan PJU 5/4 Dataran Sunway, Kota Damansara 47810 Petaling Jaya, Selangor.	Kompleks KL Gateway Sebahagian Lot 480578 Mukim Kuala Lumpur, 59200 Kuala Lumpur.	3.40	29-12-2016

Sabah

Maklumat dan Statistik
Information and Statistics



Jadual 19: Maklumat utama prestasi Sabah Electricity Sdn. Bhd. (SESB)
Table 19: Key information on Sabah Electricity Sdn. Bhd. (SESB) performance

Petunjuk • *Indicator*	Unit	2012	2013	2014	2015	2016
Kehendak maksimum *Maximum demand*	MW	828	874	908	914	945
Jumlah unit penjanaan *Total units generated*	GWj *GWh*	1,294	1,357	1,323	1,071	882
Jumlah unit jualan *Total units sold*	GWj *GWh*	4,456	4,670	4,776	5,109	5,189
Hasil jualan elektrik *Sales revenue of electricity*	RM Juta *RM Million*	1,350	1,382	1,636	1,668	1,734
Kapasiti penjanaan boleh harap *Dependable generation capacity*	MW	417	495	401	328	331
Jumlah kakitangan *Number of employees*	Orang *Person*	2,679	2,788	2,975	3,096	3,282
Hasil jualan elektrik per kakitangan *Sales revenue of electricity per employee*	RM Juta/Kakitangan *RM Million Employee*	0.50	0.50	0.55	0.54	0.53
Unit jualan per kakitangan *Units sold per employee*	GWj/ Kakitangan *GWh/ Employee*	1.66	1.68	1.61	1.65	1.58
Kapasiti boleh harap per kakitangan *Dependable capacity per employee*	MW/Kakitangan *MW/Employee*	0.16	0.18	0.13	0.11	0.10
Jumlah unit pembelian[1] *Total purchased units[1]*	GWj *GWh*	3,843	3,866	4,479	4,881	5,152
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 20: Kapasiti penjanaan boleh harap (MW) & ketersediaan keseluruhan SESB
Table 20: SESB dependable capacity (MW) & overall availability

Tahun *Year*	Hidro *Hydro*	Gas asli *Natural gas*	Diesel	Jumlah *Total*	Ketersediaan keseluruhan (%) *Overall availability (%)*
2012	68.00	105.00	245.00	417.00	70.75
2013	68.00	105.00	322.00	495.00	75.96
2014	69.60	104.50	226.60	400.70	76.80
2015	72.20	104.50	150.90	327.60	78.00
2016	78.20	104.50	147.90	330.60	73.96

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

Jadual 21: Penjanaan SESB (GWj)
Table 21: SESB generation (GWh)

Tahun *Year*	Hidro *Hydro*	Gas Asli *Natural Gas*	Diesel	Jumlah *Total*
2012	377.00	589.00	328.00	1,294.00
2013	410.00	619.00	328.00	1,357.00
2014	292.79	472.44	557.81	1,323.04
2015	271.92	417.62	381.35	1,070.89
2016	255.74	389.62	229.88	875.24

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

Tahun *Year*	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Jumlah *Total*
2012	1,436	1,923	1,038	59	4,456
2013	1,530	2,018	1,061	60	4,670
2014	1,583	2,043	1,086	63	4,776
2015	1,618	2,256	1,171	64	5,109
2016	1,761	2,352	1,101	70	5,284

Jadual 23: Bilangan pengguna SESB
Table 23: SESB number of consumers

Tahun *Year*	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Jumlah *Total*
2011	384,384	72,288	2,865	4,516	464,053
2012	403,387	75,375	2,903	4,820	486,485
2013	422,964	79,188	2,937	5,128	510,217
2014	442,516	82,472	2,906	5,349	533,243
2015	460,321	85,581	2,756	5,596	554,254
2016	478,049	90,510	1,545	5,906	576,010

SISTEM PENGHANTARAN SESB
SESB TRANSMISSION SYSTEM

Jadual 24: Keupayaan sistem penghantaran SESB
Table 24: SESB transmission system capacity

Tahun • *Year*	2012	2013	2014	2015	2016
TALIAN/KABEL SISTEM PENGHANTARAN • *TRANSMISSION SYSTEM LINES/CABLES*					
275 kV (km)	492	492	493	493	598
132 kV (km)	1,775	1,809	1,829	1,921	2,075.49
66 kV (km)	123	119	119	119	119
PENCAWANG PENGHANTARAN • *TRANSMISSION SUBSTATIONS*					
Bilangan *Number*	42	39	36	41	42
Kapasiti (MVA) *Capacity (MVA)*	4,672	3,657	4,497	4,513	4,995

SISTEM PENGAGIHAN SESB
SESB DISTRIBUTION SYSTEM

Jadual 25: Keupayaan sistem pengagihan SESB
Table 25: SESB distribution system capacity

Tahun • *Year*	2012	2013	2014	2015	2016
TALIAN/KABEL SISTEM PENGAGIHAN • *DISTRIBUTION SYSTEM LINES/CABLES*					
Talian atas (km)[1] *Overhead lines (km)[1]*	8,525	8,904	9,038	9,350	9,394
Kabel bawah tanah (km)[1,2] *Underground cables (km)[1,2]*	1,503.98	1,680.00	1,680.00	2,272.00	
PENCAWANG PENGAGIHAN • *DISTRIBUTION SUBSTATIONS*					
Bilangan *Number*	6,365	6,619	6,781	6,762	7,382
Keupayaan (MVA) *Capacity (MVA)*	4,813	5,864	5,865	4,294	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 26: Stesen-stesen jana kuasa SESB dan penjana-penjana bebas di Sabah
Table 26: SESB and IPP power stations in Sabah

	Stesen jana kuasa *Power station*	Jenis *Type*	Sumber tenaga *Energy source*	Kapasiti terpasang (MW) *Installed capacity (MW)*	Kapasiti boleh harap (MW) *Dependable capacity (MW)*
SESB	Tenom Pangi	Hidro *Hydro*	Hidro *Hydro*	75.00	75.00
	Patau-patau	CCGT	Gas asli *Natural gas*	112.00	104.50
	Melawa	Enjin diesel *Diesel engine*	Diesel	44.00	31.50
	Batu Sapi, Sandakan			20.00	17.40
	Labuk Canopy Genset, Sandakan			8.90	8.00
	Tawau (Tawau, EC)			44.00	27.00
	Kubota GT1 & GT2			64.00	64.00
	Mini Hidro Merotai - Tawau	Hidro Mini *Mini Hydro*	Hidro Mini *Mini Hydro*	1.00	0.80
	Mini Hidro Bombalai - Tawau			1.00	0.80
	Mini Hidro Melangkap			1.00	0.80
	Mini Hidro Sayap			1.00	0.80
			Jumlah kecil *Subtotal*	**371.90**	**330.60**
IPP	Ranhill Powertron Sdn. Bhd. (Teluk Salut)	CCGT	Gas asli *Natural gas*	208.64	190.00
	Sepangar Bay Corporation Sdn.Bhd.			113.80	100.00
	Ranhill Powertron II Sdn. Bhd. (Rugading)			214.80	190.00
	Kimanis Power Sdn. Bhd.			367.20	285.00
	SPR Energy (M) Sdn. Bhd.			108.20	98.19
	Stratavest Sdn. Bhd. (Libaran)	Enjin diesel *Diesel engine*	Diesel	64.40	0.00
	Serudong Power Sdn. Bhd.			37.50	36.00
			Jumlah kecil *Subtotal*	**1,114.54**	**899.19**
			JUMLAH *TOTAL*	**1,490.55**	**1,229.79**

Jadual 27: Penjanaan stesen jana kuasa SESB dan penjana-penjana bebas di Sabah
Table 27: Generation of SESB and IPP power stations in Sabah

Sumber tenaga *Energy source*	Campuran penjanaan (GWj) • *Generation mix (GWh)*			
	GAS ASLI *NATURAL GAS*	DIESEL	HIDRO *HYDRO*	JUMLAH *TOTAL*
SESB	389.62	229.88	255.74	875.24
PENJANA-PENJANA BEBAS *IPP*	4,957.71	218.57	-	5,176.28
JUMLAH *TOTAL*	**5,347.33**	**448.46**	**255.74**	**6,051.52**

Jadual 28: Stesen hidro mini SESB
Table 28: SESB mini hydro stations

Bil. *No.*	Stesen *Station*	Kapasiti terpasang (MW) *Installed capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
1.	Naradau (SESB), Ranau	1.76	4.19
2.	Kiau (SESB), Kota Belud	0.35	
3.	Carabau (SESB), Ranau	2.00	0.94
	JUMLAH *TOTAL*	**4.11**	**5.13**

Nota • *Notes:*
Data diperolehi daripada SESB *Data obtained from SESB*

Jadual 29: Pemegang lesen projek jana kuasa tenaga boleh baharu (TBB) di Sabah (Lesen sah setakat 31 Disember 2016)

Table 29: Licencees of renewable energy (RE) projects in Sabah (Valid licenses as of 31 December 2016)

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
1.	Mistral Engineering Sdn. Bhd.	Wong Tet-Jung Plantations Sdn. Bhd. Lot 075561910, Mukim Segaliud Daerah Sandakan, 90000 Sabah.	Enjin gas *Gas engine*	Biogas	21/10/2016	4.05
2.	TSH Bio-Gas Sdn. Bhd.	Lot Cl 105392989, km 56, Jalan Tawau Kunak Highway Tawau 91000 Sabah	Enjin gas *Gas engine*	Biogas	16/4/2015	3.19
3.	Cash Horse (M) Sdn. Bhd.	Lot Cl 075561929, Mukim Segaliud, Daerah Sandakan, Sabah.	Turbin stim *Steam turbine*	Biojisim *Biomass*	13/9/2013	12.00
4.	Kina Biopower Sdn. Bhd.	Lot 16359 Mukim Seguntor 90736 Sandakan, Sabah.	Turbin stim *Steam turbine*	Biojisim *Biomass*	30/11/2007	11.50
5.	Seguntor Bioenergy Sdn. Bhd.	Lot Nt.073020309 Mukim Seguntor Daerah Sandakan 90736 Sabah.	Turbin stim *Steam turbine*	Biojisim *Biomass*	30/11/2007	13.50
6.	TSH Bio-Energy Sdn. Bhd.	Km 65, Jalan Tawau - Kunak, Tawau, Sabah	Turbin stim *Steam turbine*	Biojisim *Biomass*	14/10/2003	14.00
7.	Esajadi Power Sdn. Bhd.	Sungai Kadamaian, Kota Belud, Sabah.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	31/3/2008	2.00
8.	Esajadi Power Sdn. Bhd.	Sungai Pangpuyan, Kota Marudu, Sabah.	Hidro mini *Mini hydro*	Hidro mini *Mini hydro*	31/3/2008	4.50
9.	QL Tawau Biogas Sdn. Bhd.	Ql Palm Oil Mill, Lot 105355977, Mukim Kunak, Daerah Tawau, 91000 Sabah.	Enjin gas *Gas engine*	Biojisim *Biomass*	16/6/2016	2.40
10.	Api Api Energy Sdn. Bhd.	No. Lot 055028192, Mukim Kota Kinabalu, Daerah Kudat, 89800 Sabah.	PV Modul	Solar	31/12/2015	1.00
11.	Asiatic Eco Forest Sdn. Bhd.	CL105112301, 91000 Tawau, Sabah.	PV Modul	Solar	8/1/2015	0.34
12.	Borneo Starcruise Sdn. Bhd.	Sebahagian NT023037078, Mukim Kg Manggis, Daerah Papar, 89600 Sabah.	PV Modul	Solar	8/11/2016	0.18
13.	Cahaya Metro Sdn. Bhd.	Lot Cl 025088877, Mukim Bongawan, 89709 Papar, Sabah.	PV Modul	Solar	8/1/2015	1.00
14.	Diamond Uptown Sdn. Bhd.	Sebahagian Lot 1555, Mukim Kudat, Daerah Kudat, 89100 Sabah.	PV Modul	Solar	2/3/2015	1.00
15.	Digital Awan Sdn. Bhd.	Sebahagian Lot PT 2129, Mukim Kampung Binaong, Daerah Keningau, 89007 Sabah.	PV Modul	Solar	15/10/2015	1.00
16.	Energy Bay Sdn. Bhd.	Lot Nt 043099341, Daerah Tuaran, Kg. Pogunlawid, 89600 Tuaran, Sabah.	PV Modul	Solar	28/12/2015	1.00
17.	Evergreen Technology (M) Sdn. Bhd.	Sebahagian Lot 075510799, Mile 27, Jalan Labuk, Mukim Sungai Manuel, 90000 Daerah Sandakan, Sabah.	PV Modul	Solar	23/12/2015	1.00
18.	Firma Odesi Sdn. Bhd.	Lot 075405417, Mile 16, Jalan Labuk, Mukim Gum-Gum, 90000 Daerah Sandakan, 90000 Sandakan, Sabah.	PV Modul	Solar	4/1/2016	1.00
19.	Genertech Construction Sdn. Bhd.	Sebahagian Lot Nt043225636, Mukim Tuaran, Daerah Kampung Lok Batik, Jalan Sulaman, 89200 Tuaran, Sabah	PV Modul	Solar	23/11/2016	0.43

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
20.	Green Leadership Sdn. Bhd.	Sebahagian Lot CI 135348051, CI 13531-280, Batu 5 1/2, Mukim Nabawan, Daerah Keningau, 89000 Sabah.	PV Modul	Solar	4/12/2014	1.00
21.	Green Leadership Sdn. Bhd.	Lot CI 135348051, Mukim Kampung Biah, Daerah Keningau, 89000 Sabah.	PV Modul	Solar	12/11/2015	1.00
22.	GV Bumisinar Sdn. Bhd.	Sebahagian Lot 053051737, Mukim Kg Liman Limawan, Daerah Kudat, 89050 Sabah.	PV Modul	Solar	2/3/2015	0.60
23.	Inovasi Kurnia Sdn. Bhd.	Nt 3598 Kampung Kota Peladok, Jalan Tamau Kota Belud 89150	PV Modul	Solar	29/12/2015	1.00
24.	KL Timber Sdn. Bhd.	Sebahagian Lot 135319452 Mukim Pampang Daerah Keningau, 89000 Sabah.	PV Modul	Solar	29/12/2016	0.85
25.	Kuala Penyu Solar Sdn. Bhd.	Sebahagian Nt 183308214 Kampong Tamu Kayul 89740 Kuala Penyu Sabah	PV Modul	Solar	22/12/2016	0.70
26.	Lok Kawi Plastic Industries Sdn. Bhd.	Lot 64, Lok Kawi, Daerah Papar, 88100 Kota Kinabalu, Sabah.	PV Modul	Solar	12/11/2015	0.18
27.	Marudu Engineering Sdn. Bhd.	Sebahagian Lot No. Nt 15445 (L.A.312-61), Mukim Kampung Rorongkom, Daerah Kudat, 00000 Sabah.	PV Modul	Solar	4/12/2014	1.00
28.	Marudu Power Sdn. Bhd.	Sebahagian Nt 224027678 Kg Goshen, Bandau 89100 Kudat, Sabah	PV Modul	Solar	29/12/2016	1.00
29.	Microvest Power Ventures Sdn. Bhd.	Nt053029217 Kampung Tambuluran Kudat 89050	PV Modul	Solar	12/11/2015	1.00
30.	Mutiara Desaru Sdn. Bhd.	Sebahagian Lot Nt 1614 Mukim Kg. Sempudu Daerah Papar, 89600 Sabah.	PV Modul	Solar	14/11/2016	0.42
31.	NK Energy Sdn. Bhd.	Sebahagian Lot 109, Daerah Kudat, 89050 Sabah.	PV Modul	Solar	2/11/2016	0.99
32.	North-East Destiny Sdn. Bhd.	5th Floor, 1 Borneo Hypermall, Jalan Sulaman, 88400 Kota Kinabalu, Sabah.	PV Modul	Solar	28/1/2016	0.41
33.	Powernet Venture Sdn. Bhd.	Sebahagian Lot 115, Mukim Pegagau, Daerah Semporna, 91308 Sabah	PV Modul	Solar	23/11/2016	1.00
34.	Sabakekal Sdn. Bhd.	Lot No. 2 Batu 1 1/2 Jalan Buli Sim Sim Sandakan 90000, Sabah	PV Modul	Solar	13/1/2015	1.00
35.	Sibuga Energy Sdn. Bhd.	Sebahagian Lot CI 075349647, Daerah Sandakan, 90000 Sabah.	PV Modul	Solar	2/11/2016	0.99
36.	SMR Aquaculture Sdn. Bhd.	Lot CI. 105510870, Mukim Mas Mas Kalumpang, 91000 Daerah Tawau, Sabah.	PV Modul	Solar	8/1/2015	1.00
37.	Sri Sabawak Energy Sdn. Bhd.	Sebahagian Lot Nt 043196587 Mukim Kampung Laya-Laya 89200 Tuaran	PV Modul	Solar	29/12/2015	1.00
38.	Sunwide Resources Sdn. Bhd.	Sebahagian Lot 105556509, Mukim Tawau, Daerah Tawau, 91000 Sabah	PV Modul	Solar	19/7/2016	0.43
39.	SW7 Sdn. Bhd.	Sebahagian Lot Nt 183308214 Mukim Kampong Tamu Kayol 89740 Kuala Penyu	PV Modul	Solar	20/1/2016	1.00
40.	Tenaga Solar Beaufort Sdn. Bhd.	Lot B1170494 Kg Mawao Membakut Beaufort 89800	PV Modul	Solar	31/12/2015	1.00
41.	Tiong Cheong Bricks Sdn. Bhd.	2762 Tuaran Tuaran 89207 Sabah	PV Modul	Solar	29/12/2014	0.69

Bil. *No.*	Pemegang lesen *Licensee*	Alamat pepasangan *Installation address*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Tarikh lesen dikeluarkan *License issuance date*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
42.	TR Energy Sdn. Bhd.	Lot 172, Daerah Kudat, 89050 Sabah.	PV Modul	Solar	7/10/2015	0.99
43.	TTL Energy Sdn. Bhd.	Sebahagian No. Lot 023166154, 89608 Daerah Papar, Sabah.	PV Modul	Solar	22/11/2016	1.00
44.	Vista Serijuta Sdn. Bhd	Sebahagian Lot No. 10200111 Sabah Ports Sdn. Bhd. 91000 Tawau	PV Modul	Solar	23/12/2015	0.34

Nota • *Notes:*
1. Semua pemegang lesen dalam jadual di atas mendapat kuota Feed-in Tariff (FiT) *All the licensees in the table above get a quota of Feed-in Tariff (FiT)*

Jadual 30: Kapasiti dilesenkan dan penjanaan tenaga boleh baharu (TBB) di Sabah
Table 30: Licensed capacity and generation of renewable energy (RE) licensees in Sabah

Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) Licensed capacity (MW)	Penjanaan (GWj) *Generation (GWh)*
BIOJISIM *BIOMASS*	51.00	210.62
BIOGAS	9.64	20.33
HIDRO MINI *MINI HYDRO*	6.50	4.69
SOLAR	24.77	7.43
JUMLAH *TOTAL*	**91.91**	**243.06**

Nota • *Notes:*
Berdasarkan laporan yang dihantar oleh pemegang lesen setakat 5 Mac 2018 *Based on the reports submitted by the licensees as of 5 March 2018*

Jadual 31: *Cogeneration* persendirian Sabah (lesen sah setakat 31 Disember 2016)
Table 31: Private cogeneration in Sabah (valid license as of 31December 2016)

Bil. *No.*	Pemegang lesen *Licensee*	Daerah *District*	Tarikh mula sah lesen *License start date*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
1.	FELDA Palm Industries Sdn. Bhd.	Lahad Datu	8/10/2011	Turbin Stim *Steam Turbine*	Biojisim *Biomass*	7.50
2.	PETRONAS Chemicals Fertiliser Sabah Sdn. Bhd.	Sipitang	13/3/2013	CCGT	Gas asli *Natural gas*	65.00
3.	Sabah Forest Industries Sdn. Bhd.	Sipitang	21/9/2012	Turbin Stim *Steam Turbine*	Biojisim *Biomass*	79.50
					JUMLAH *TOTAL*	**152.00**

Jadual 32: Kapasiti dilesenkan dan penjanaan *cogeneration* persendirian di Sabah
Table 14: Licensed capacity and generation of private cogeneration in Sabah

Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) Licensed capacity (MW)	Penjanaan (GWj) *Generation (GWh)*
BIOJISIM *BIOMASS*	87.00	18.38
GAS ASLI *NATURAL GAS*	65.00	0.01
JUMLAH *TOTAL*	**152.00**	**18.39**

Jadual 33: *Cogeneration* awam Sabah (lesen sah setakat 31 Disember 2016)
Table 33: Public cogeneration in Sabah (valid license as of 31 December 2016)

Bil. *No.*	Pemegang lesen *Licensee*	Daerah *District*	Tarikh mula sah lesen *License start date*	Jenis loji *Plant type*	Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*
1.	Eksons Biomass Energy Sdn. Bhd.	Tawau	3/7/2007	Turbin Stim *Steam Turbine*	Biojisim *Biomass*	3.00
2.	Evergreen Intermerge Sdn. Bhd.	Tawau	10/10/2006	Enjin diesel *Diesel engine*	Biojisim *Biomass*	6.00
3.	IOI Bio-Energy Sdn. Bhd.	Sandakan	20/01/2010	Enjin diesel *Diesel engine*	Biojisim *Biomass*	15.00
4.	SEO Energy Sdn. Bhd.	Sandakan	19/01/2012	Enjin diesel *Diesel engine*	Biojisim *Biomass*	1.20
5.	Untung Ria Sdn. Bhd.	Keningau	8/9/2010	Turbin stim & enjin Diesel *Steam turbine & diesel engine*	Biojisim *Biomass*	4.00
6.	PETRONAS Methanol Labuan	Labuan	18/7/2007	CCGT	Gas asli *Natural gas*	41.80
					JUMLAH *TOTAL*	**71.00**

Jadual 34: Kapasiti dilesenkan dan penjanaan *cogeneration* awam di Sabah
Table 34: Licensed capacity and generation of public cogeneration in Sabah

Sumber tenaga *Energy source*	Kapasiti dilesenkan (MW) *Licensed capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
BIOJISIM *BIOMASS*	29.20	36.49
GAS ASLI *NATURAL GAS*	41.80	n/a
JUMLAH *TOTAL*	**71.00**	**36.49**

Jadual 35: Penjanaan persendirian kurang 5 MW di Sabah
Table 35: Less-than-5 MW self generation in Sabah

				Elektrik dijana (GWj) mengikut sumber tenaga *Generated Electricity by Energy Source (GWh)*					
Bil. *No.*	Pejabat Kawasan ST *ST Regional Office*	Bilangan Lesen Sah shg. 31 Dis. 2016 *No. of Valid License as of 31 Dec. 2016*	Kapasiti (MW) *Capacity (MW)*	DIESEL	*DISTILLATE*	TANDAN SAWIT KOSONG *EMPTY FRUIT BUNCHES*	BIOGAS	HABUK KAYU *WOOD DUST*	JUMLAH *TOTAL*
1.	Pantai Barat *West Coast*	194	87.76	4.15	-	3.62	-	-	7.77
6.	Pantai Timur *East Coast*	830	578.30	80.23	45.33	183.23	4.72	4.20	317.71
	JUMLAH *TOTAL*	**1,024**	**666.06**	84.38	45.33	186.85	4.72	4.20	**325.48**

Nota • *Notes:*
Data tahun 2015 daripada pejabat-pejabat kawasan ST *Year 2015 data from ST regional offices*

Sarawak

Maklumat dan Statistik
Information and Statistics

Jadual 36: Maklumat utama prestasi Sarawak Energy Berhad (SEB)
Table 36: Key information on SEB performance

Petunjuk • *Indicator*	Unit	2012	2013	2014	2015	2016
Kehendak maksimum *Maximum demand*	MW	1,229	1,466	2,036	2,288	3,010
Jumlah unit penjanaan [1] *Total units generated [1]*	GWj *GWh*	7,025	6,572	6,494	7,913	10,144
Jumlah unit jualan [2] *Total units sold [2]*	GWj *GWh*	7,587	10,420	13,440	14,038	20,627
Hasil jualan elektrik *Sales revenue of electricity*	RM Juta *RM Million*	1,862	2,266	2,752	2,911	4,140
Kapasiti terpasang *Installed capacity*	MW	1,352	1,332	1,551	2,241	2,262
Jumlah kakitangan *Number of employees*	Orang *Person*	3,882	4,040	4,174	4,307	4,468
Hasil jualan elektrik per kakitangan *Sales revenue of electricity per employee*	RM Juta/Kakitangan *RM Million Employee*	0.48	0.56	0.66	0.68	0.93
Unit jualan per kakitangan *Units sold per employee*	GWj/ Kakitangan *GWh/ Employee*	1.95	2.58	3.59	3.26	4.77
Kapasiti terpasang per kakitangan *Installed capacity per employee*	MW/Kakitangan *MW/Employee*	0.35	0.33	0.37	0.52	0.51
Jumlah unit pembelian *Total purchased units*	GWj *GWh*	2,712	5,414	8,457	7,721	12,158
Jumlah unit eksport *Total exported units*	GWj *GWh*	-	-	-	-	693
Jumlah unit import *Total imported units*	GWj *GWh*	-	-	-	-	-

Nota • *Notes:*
[1] Jumlah unit penjanaan bagi SEB tidak termasuk IPP di Sarawak *Generation mix for SEB excludes IPPs in Sarawak*
[2] Jualan tenaga elektrik bagi SEB termasuk pembelian daripada IPP di Sarawak *Sales of electricity for SEB includes the purchase from IPPs in Sarawak*

Jadual 37: Kapasiti terpasang SEB (MW)
Table 37: SEB installed capacity (MW)

Tahun *Year*	Hidro* *Hydro**	Gas asli *Natural gas*	Arang batu *Coal*	Diesel	Jumlah *Total*
2012	101	608	480	163	1,352
2013	101	588	480	163	1,332
2014	337	576	480	158	1,551
2015	1,052*	595	480	114	2,241
2016	1,054	615	480	114	2,262

Nota • *Notes:*
*Hidro merangkumi Loji Hidroelektrik Batang Ai Syarikat SESCO Berhad, Loji Hidroelektrik Murum dan hidro mini 1.70 MW *Hydro includes SESCO Berhad Batang Ai Hydroelectric Plant, Murum Hydroelectric Plant and 1.70 MW mini hydro*

Jadual 38: Campuran penjanaan SEB (GWj)
Table 38: SEB generation mix (GWh)

Tahun *Year*	Hidro* *Hydro**	Gas asli *Natural gas*	Arang batu *Coal*	Diesel	Jumlah *Total*
2012	433	2,777	3,037	778	7,025
2013	363	3,015	3,046	148	6,572
2014	444	2,706	3,157	187	6,494
2015	2,459	2,065	3,217	173	7,914
2016	3,909	3,109	3,090	36	10,144

Nota • *Notes:*
*Hidro merangkumi Loji Hidroelektrik Batang Ai Syarikat SESCO Berhad, Loji Hidroelektrik Murum dan hidro mini 1.70 MW *Hydro includes SESCO Berhad Batang Ai Hydroelectric Plant, Murum Hydroelectric Plant and 1.70 MW mini hydro*

Jadual 39: Jualan tenaga elektrik SEB (GWj)
Table 39: SEB electricity sales (GWh)

Tahun *Year*	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Esport *Export*	Jumlah *Total*
2012	1,584	2,026	3,904	73	-	7,587
2013	1,722	2,169	6,457	72	-	10,420
2014	1,817	2,291	9,254	78	-	13,440
2015	1,940	2,390	9,619	89	-	14,038
2016	2,101	2,513	15,936	77	693	21,320

Jadual 40: Bilangan pengguna SEB
Table 40: SEB number of consumers

Tahun *Year*	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Esport *Export*	Jumlah *Total*
2012	461,422	79,278	970	7,383	-	549,053
2013	483,106	82,160	985	7,699	-	573,950
2014	498,601	85,188	984	8,152	-	592,925
2015	516,084	88,297	1,004	8,939	-	614,324
2016	536,466	91,359	1,013	9,457	4	638,299

SISTEM PENGHANTARAN SEB
SEB TRANSMISSION SYSTEM

Jadual 41: Keupayaan sistem penghantaran SEB
Table 41: SEB transmission system capacity

Tahun • *Year*	2012	2013	2014	2015	2016
TALIAN/KABEL SISTEM PENGHANTARAN • *TRANSMISSION SYSTEM LINES/CABLES*					
275 kV (km)	1,086	1,188	1,235	1,204	1,331
132 kV (km)	383	398	372	384	388
66 kV (km)	-	-	-	-	-
PENCAWANG PENGHANTARAN • *TRANSMISSION SUBSTATIONS*					
Bilangan *Number*	25	27	28	28	30
Kapasiti (MVA) *Capacity (MVA)*	5,876	6,356	6,440	6,359.6	7,239.6

SISTEM PENGAGIHAN SEB
SEB DISTRIBUTION SYSTEM

Jadual 42: Keupayaan sistem pengagihan SEB
Table 42: SEB distribution system capacity

Tahun • *Year*	2012	2013	2014	2015	2016
TALIAN/KABEL SISTEM PENGAGIHAN • *DISTRIBUTION SYSTEM LINES/CABLES*					
Talian atas (km) *Overhead lines (km)*	21,030	22,350	23,210	24,031	24,681
Kabel bawah tanah (km) *Underground cables (km)*	6,680	6,969	7,274	7,688	8,122
PENCAWANG PENGAGIHAN • *DISTRIBUTION SUBSTATIONS*					
Bilangan *Number*	9,588	10,365	10,927	11,435	12,522
Keupayaan (MVA) *Capacity (MVA)*	3,744	4,002	4,174	4,339	8,735

Jadual 43: Stesen-stesen jana kuasa utama di Sarawak
Table 43: Main power stations in Sarawak

Penjana *Generator*	Penggerak utama *Prime mover*	Sumber tenaga *Energy source*	Kapasiti terpasang (MW) *Installed capacity (MW)*	Kapasiti tersedia (MW) *Available capacity (MW)*	Penjanaan (GWj) *Generation (GWh)*
SEB	Turbin stim *Steam turbine*	Arang batu *Coal*	480.00	423.00	3,089.61
	Enjin diesel *Diesel engine*	Diesel	49.80	34.00	36.19
	Turbin gas *Gas turbine*	Gas asli *Natural gas*	658.60	636.00	3,108.95
	Turbin gas kitar padu *Combined cycle gas turbine*				
	Hidro *Hydro*	Hidro *Hydro*	1,053.80	1,033.70	3,905.33
	Hidro mini *Mini hydro*	Hidro Mini *Mini Hydro*	1.70	1.70	3.42
	Solar	Solar PV	0.30	0.30	0.12
		Jumlah kecil ***Subtotal***	**2,244.20**	**2,128.70**	**10,143.62**
IPP	Hidro *Hydro*	Hidro *Hydro*	2,400.00	2,000.00	12,285.00
		Jumlah kecil ***Subtotal***	**2,400.00**	**2,000.00**	**12,285.00**
Cogeneration		Gas asli *Natural gas*	389.00	389.00	1,803.37
		Jumlah kecil ***Subtotal***	**389.00**	**389.00**	**1,803.37**
Penjanaan persendirian ***Self-gen***		Diesel/MFO	11.60	11.60	15.00
		Biojisim *Biomass*	49.00	49.00	111.87
		Biogas	0.50	0.50	0.00
		Lain-lain *Others*	5.10	5.10	9.754
		Jumlah kecil ***Subtotal***	**66.20**	**66.20**	**136.62**
		JUMLAH *TOTAL*	**5,099.40**	**4,583.90**	**24,368.61**

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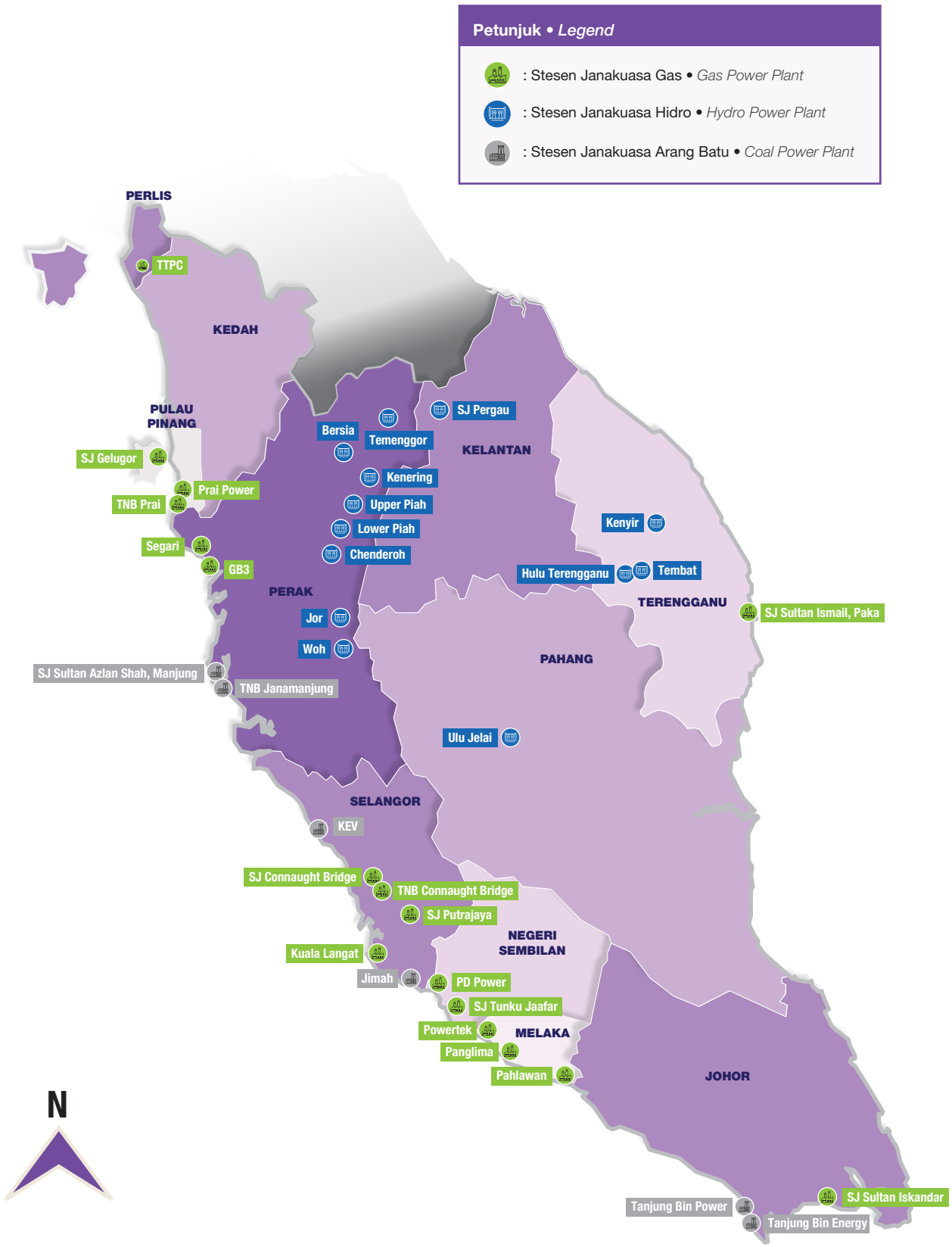
Peta Lokasi Stesen Jana Kuasa di Semenanjung, Sabah dan Sarawak

Location Maps of Power Plants in Peninsular, Sabah and Sarawak

Maklumat dan Statistik
Information and Statistics

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

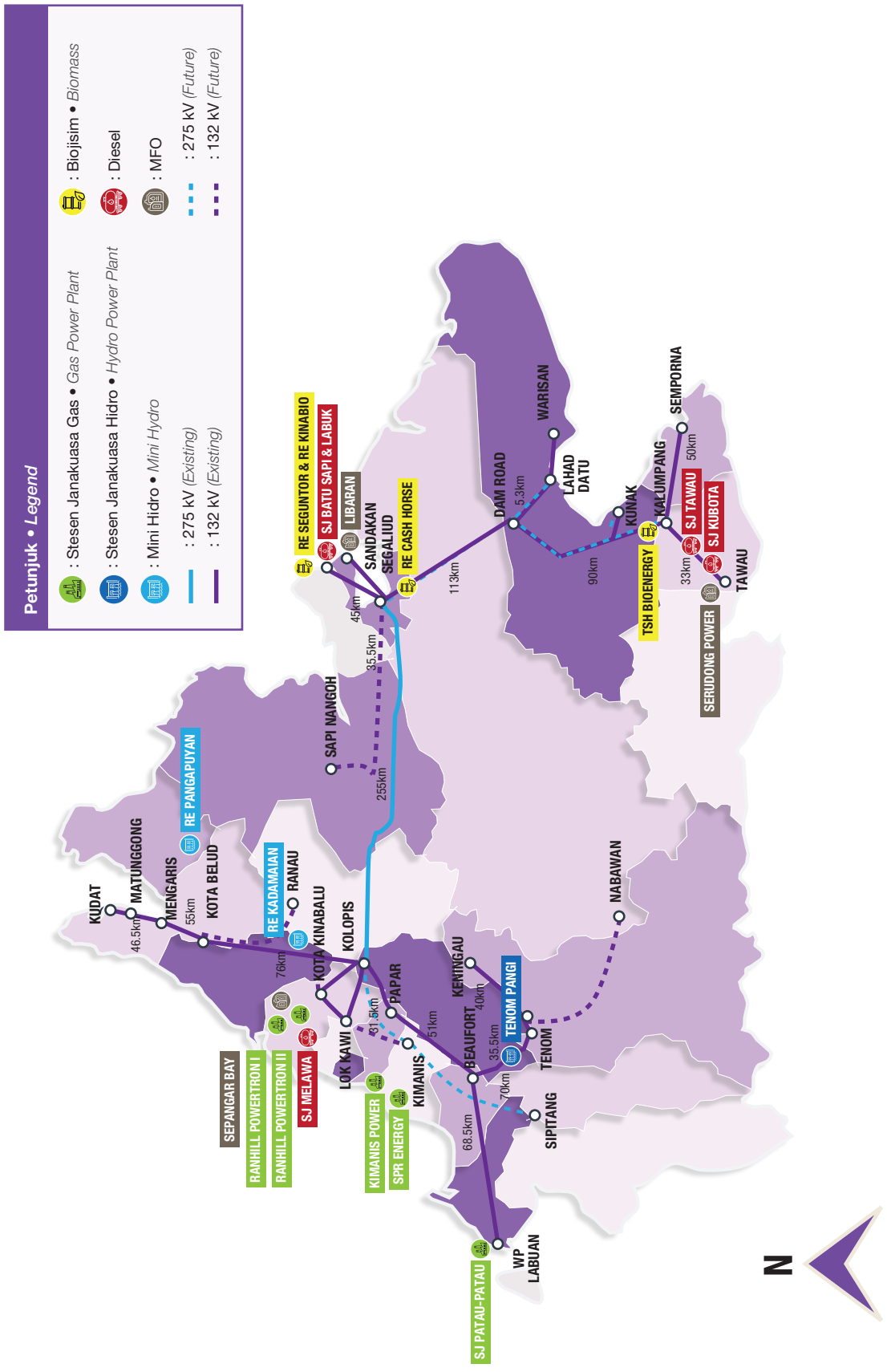


Peta 2: Sistem penghantaran elektrik di Semenanjung Malaysia
Map 2: Electricity transmission system in Peninsular Malaysia

Sumber • Source: TNB

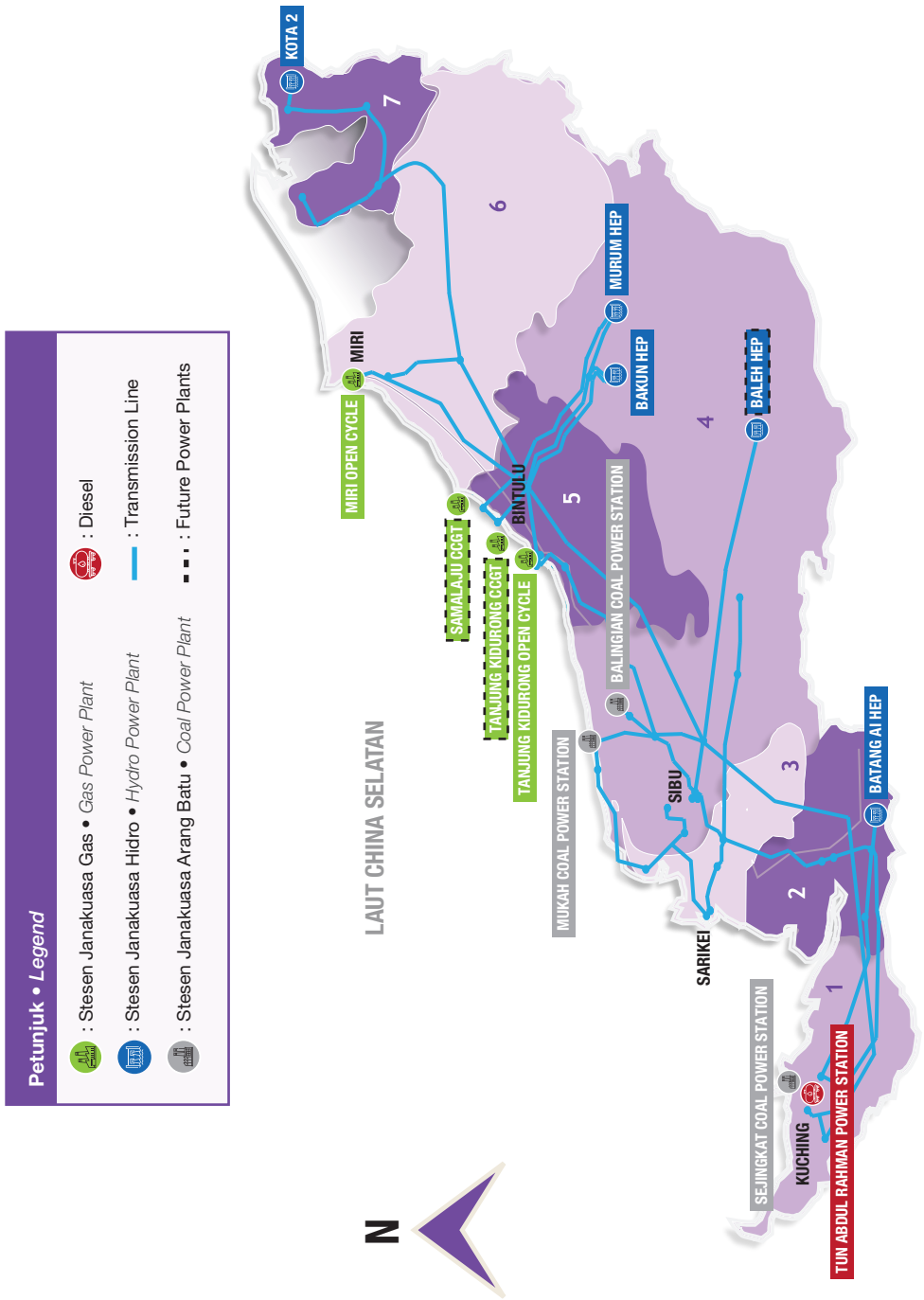
Peta 3: Lokasi stesen jana kuasa utama dan sistem grid di Sabah

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

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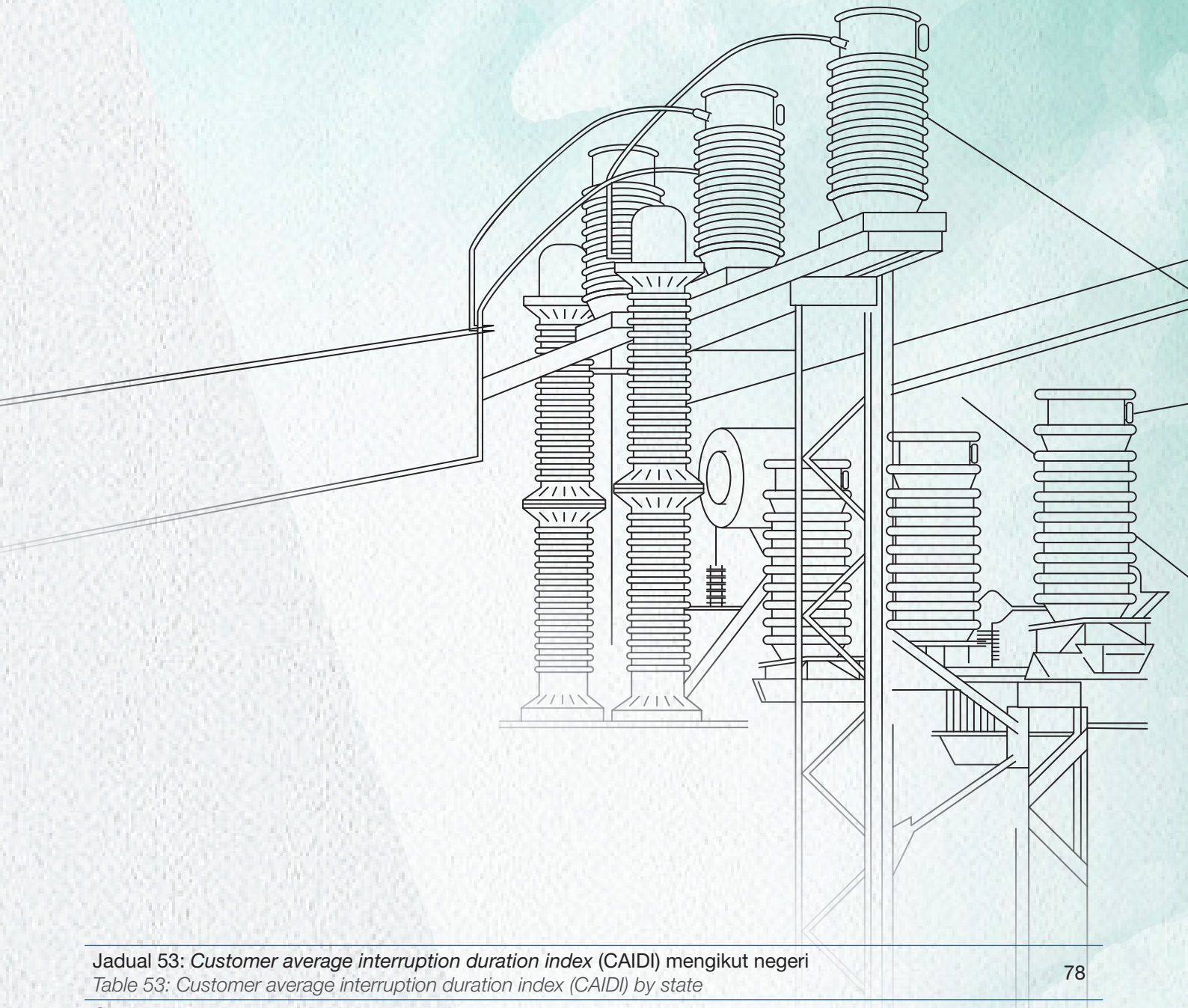
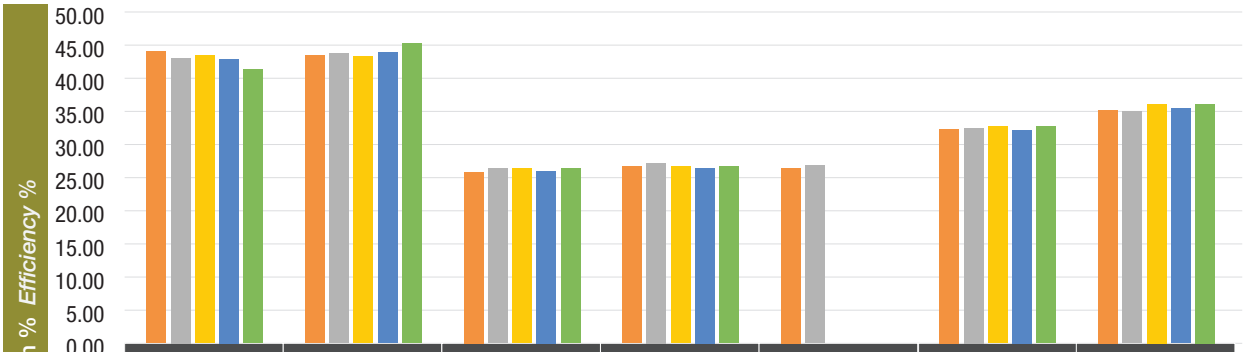
Peninsular Malaysia

Maklumat Prestasi
Performance Information



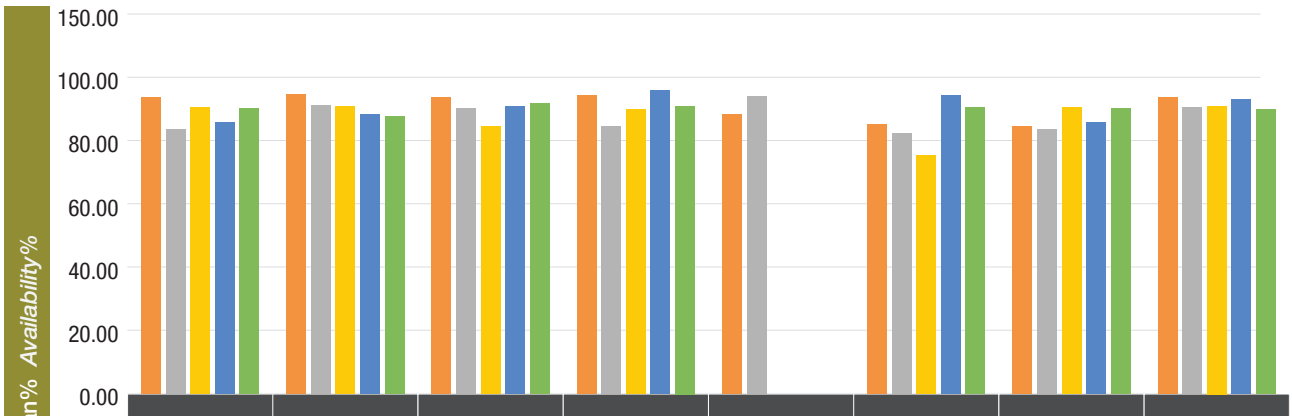
SISTEM PENJANAAN TNB & PENJANA-PENJANA BEBAS DI SEMENANJUNG MALAYSIA
GENERATION SYSTEM OF TNB & INDEPENDENT POWER PRODUCERS (IPP) IN PENINSULAR MALAYSIA

Carta 1: Purata kecekapan *thermal* mengikut jenis loji jana kuasa
Chart 1: Average thermal efficiency by type of power plants



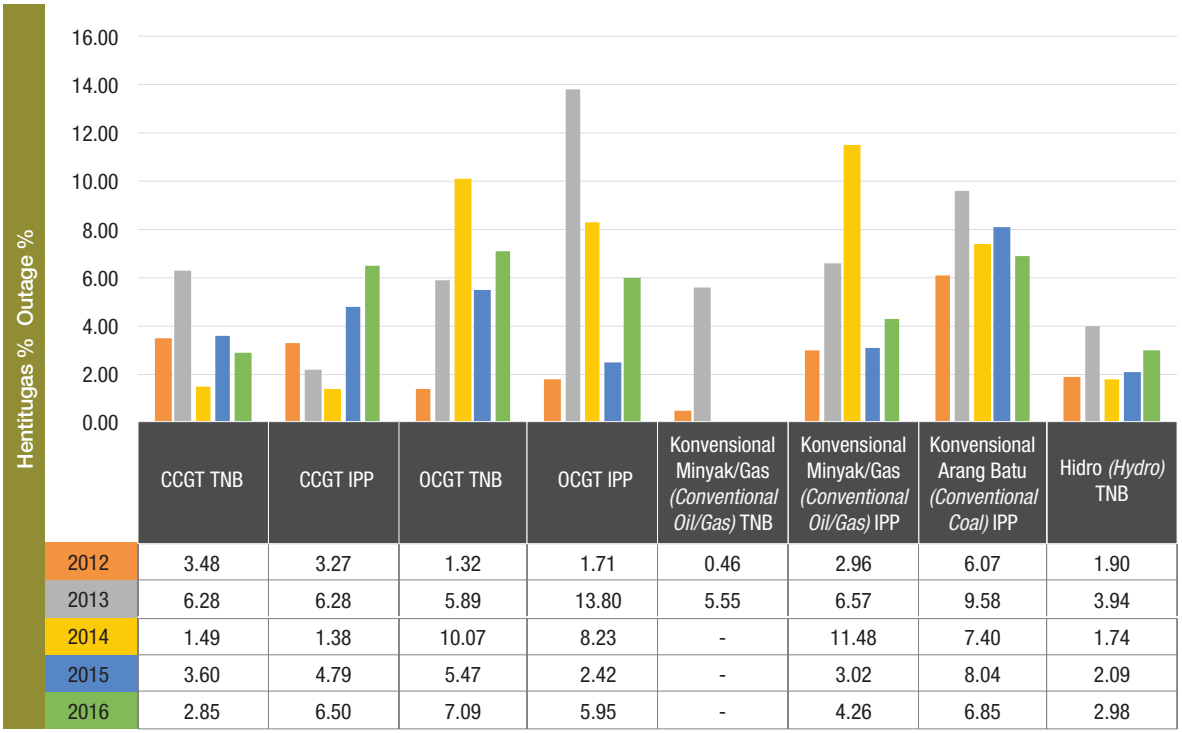
	CCGT TNB	CCGT IPP	OCGT TNB	OCGT IPP	Konvensional Minyak/Gas *(Conventional Oil/Gas)* TNB	Konvensional Minyak/Gas *(Conventional Oil/Gas)* IPP	Konvensional Arang Batu *(Conventional Coal)* IPP
2012	44.34	43.96	26.29	26.77	26.60	32.34	35.53
2013	43.30	44.00	26.7	27.4	27.00	32.70	35.20
2014	43.63	43.66	26.7	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

Carta 2: Purata faktor kesediaan setara (EAF) mengikut jenis loji jana kuasa
Chart 2: Average equivalent availability factor (EAF) by type of power plants



	CCGT TNB	CCGT IPP	OCGT TNB	OCGT IPP	Konvensional Minyak/Gas *(Conventional Oil/Gas)* TNB	Konvensional Minyak/Gas *(Conventional Oil/Gas)* IPP	Konvensional Arang Batu *(Conventional Coal)* IPP	Hidro *(Hydro)* TNB
2012	94.14	95.10	94.14	95.10	88.53	85.42	84.18	90.77
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

Carta 3: Purata faktor henti tugas tidak berjadual setara (EUOF) mengikut jenis loji jana kuasa
Chart 3: Average equivalent unplanned outage factor (EUOF) by type of power plants



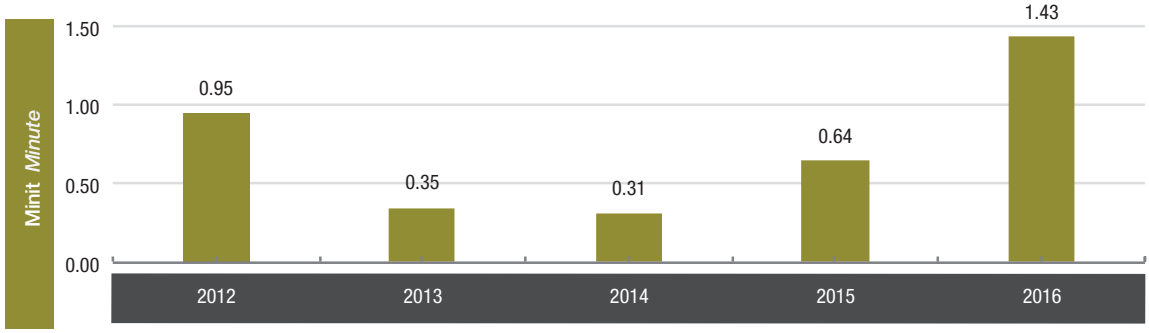
	CCGT TNB	CCGT IPP	OCGT TNB	OCGT IPP	Konvensional Minyak/Gas *(Conventional Oil/Gas)* TNB	Konvensional Minyak/Gas *(Conventional Oil/Gas)* IPP	Konvensional Arang Batu *(Conventional Coal)* IPP	Hidro *(Hydro)* TNB
2012	3.48	3.27	1.32	1.71	0.46	2.96	6.07	1.90
2013	6.28	6.28	5.89	13.80	5.55	6.57	9.58	3.94
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

SISTEM PENGHANTARAN TNB
TNB TRANSMISSION SYSTEM

Jadual 44: Pelantikan sistem penghantaran TNB dengan kehilangan beban sebanyak 50 MW dan ke atas
Table 44: TNB transmission system trippings with load loss of 50 MW and above

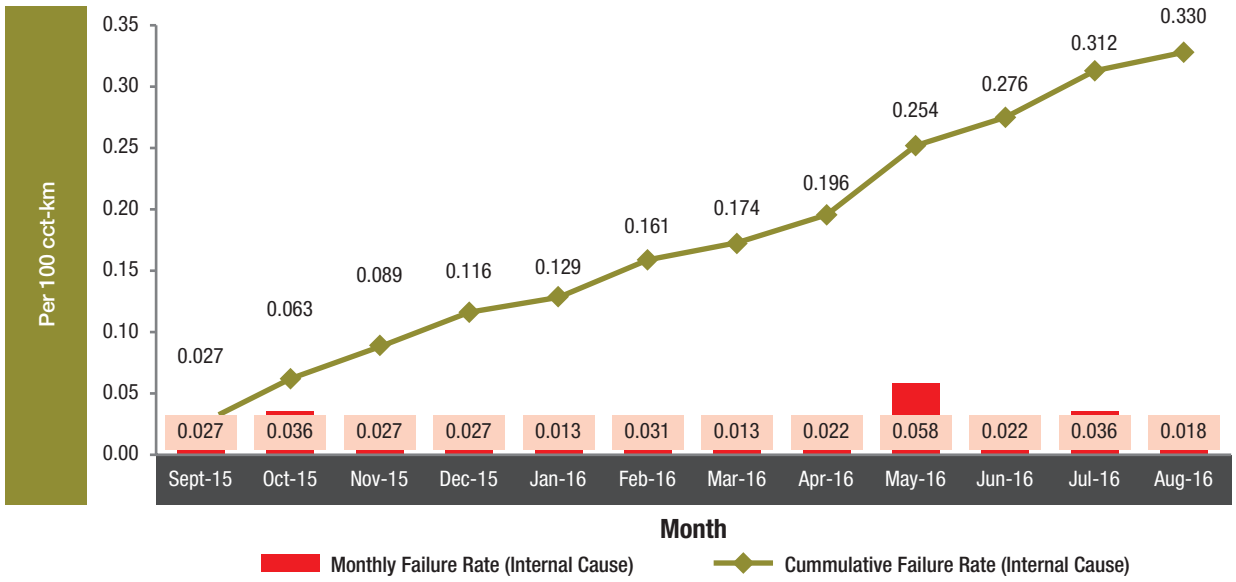
Petunjuk • *Indicator*	2012	2013	2014	2015	2016
Bilangan pelantikan tanpa lucutan beban *Number of trippings without load shedding*	4	2	1	1	3
Tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Unsupplied energy during trippings (MWh)*	212.70	238.20	1.20	-	344.85
Bilangan pelantikan dengan lucutan 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

Carta 4: *Delivery Point Unreliability Index* (DePUI) - *system minutes* TNB
Chart 4: Delivery Point Unreliability Index (DePUI) – TNB system minutes



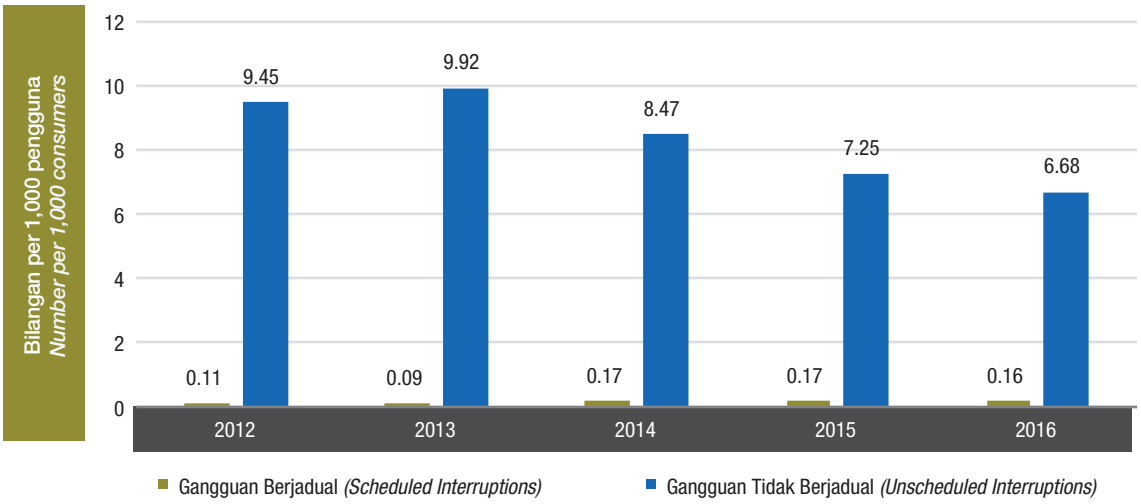
Nota • *Notes:*
Data tahun kewangan *Financial year data*

Carta 5: Insiden pelantikan bulanan TNB bagi talian/kabel per 100 cct-km
Chart 5: TNB monthly tripping incidents for lines/cables per 100 cct-km

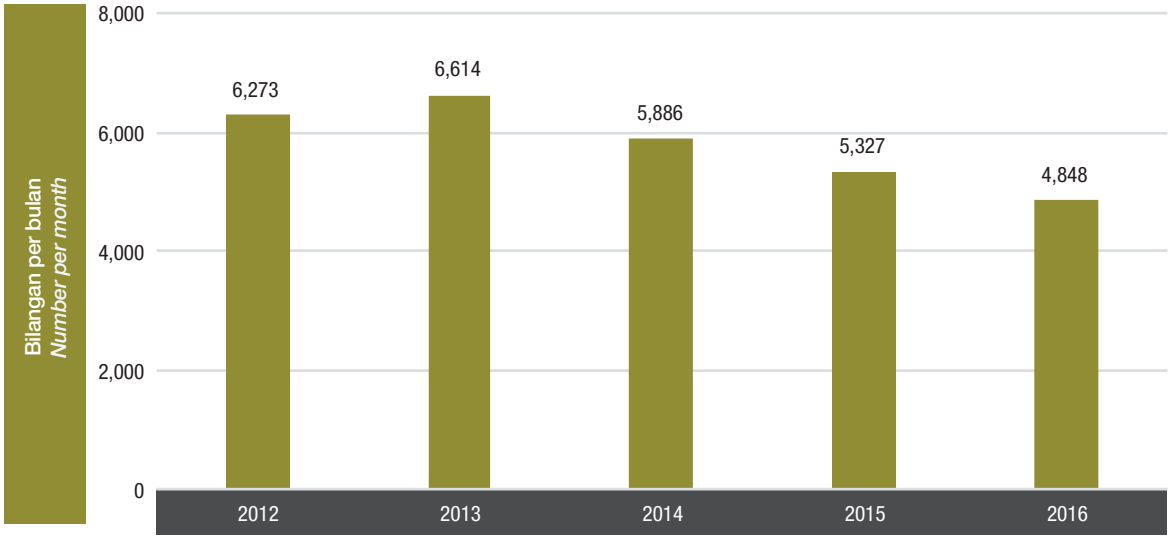


Nota • *Notes:*
Data tahun kewangan yang diperolehi daripada Laporan Syarat Lesen 25 (4) TNB (Transmission Reliability Standard) TNB November 2016
Financial year data obtained from License Condition 25(4) TNB (Transmission Reliability Standard) TNB November 2016

Carta 6: Gangguan bekalan elektrik per 1,000 pengguna TNB
Chart 6: TNB electricity supply interruptions per 1,000 consumers



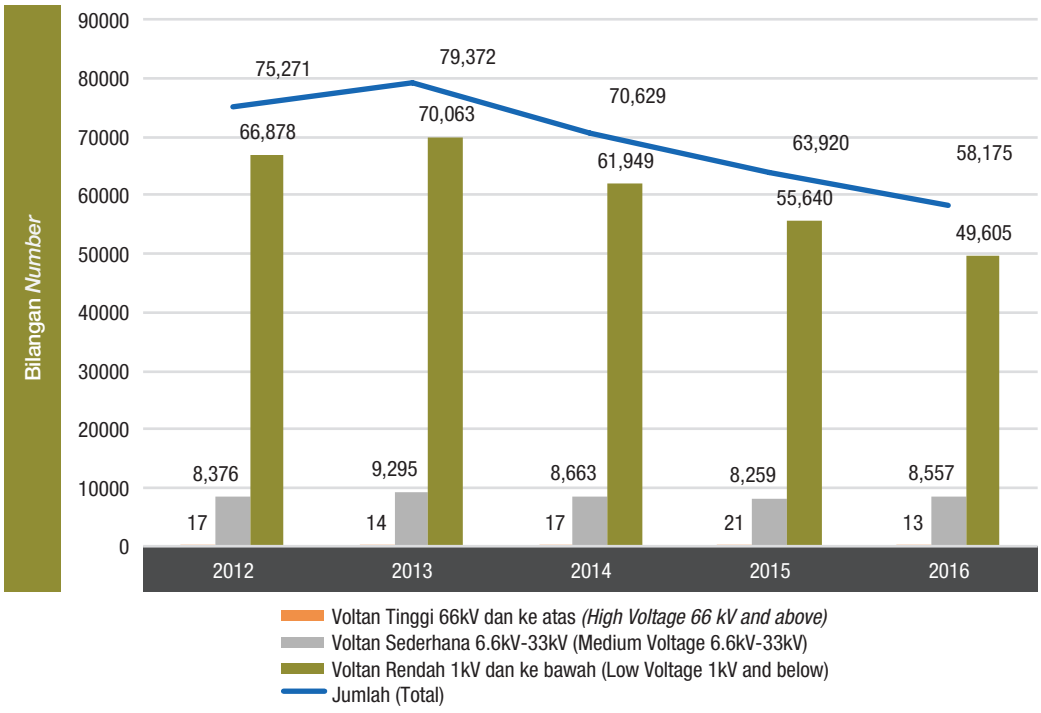
Carta 7: Purata gangguan bekalan elektrik bulanan TNB
Chart 7: TNB monthly average electricity supply interruptions



Jadual 45: Gangguan bekalan elektrik TNB mengikut negeri
Table 45: TNB electricity supply interruptions by state

NEGERI • *STATE*	2012	2013	2014	2015	2016
Johor	11,935	11,554	7,719	8,354	7,649
Kedah	6,590	6,642	5,538	3,799	3,999
Kelantan	7,843	7,469	5,901	5,781	3,832
Kuala Lumpur	10,481	9,861	9,391	9,470	8,779
Melaka	2,318	3,307	3,939	1,694	1,458
N. Sembilan	4,876	6,264	4,966	5,226	4,784
P. Pinang	6,269	6,678	5,021	3,815	3,348
Pahang	4,039	4,460	5,399	4,971	5,874
Perak	7,598	8,029	8,050	6,601	5,538
Perlis	420	422	1,086	465	343
Putrajaya / Cyberjaya	7	9	4	25	13
Selangor	9,745	10,968	9,768	12,268	11,332
Terengganu	3,150	3,709	3,847	1,451	1,226
JUMLAH *TOTAL*	**75,271**	**79,372**	**70,629**	**63,920**	**58,175**

Carta 8: Gangguan bekalan elektrik mengikut tahap voltan TNB
Chart 8: TNB electricity supply interruptions by voltage level



Jadual 46: Bilangan gangguan bekalan elektrik TNB
Table 46: TNB number of electricity supply interruptions

BILANGAN • *NUMBER*	2012	2013	2014	2015	2016
Gangguan tidak berjadual *Unscheduled interruptions*	74,436	78,647	69,260	62,420	56,775
Gangguan berjadual *Scheduled interruptions*	835	725	1,369	1,500	1,400
JUMLAH *TOTAL*	**75,271**	**79,372**	**70,629**	**63,920**	**58,175**

Jadual 47: Gangguan bekalan elektrik tidak berjadual mengikut jenis gangguan (tidak termasuk gangguan voltan tinggi)

Table 47: Number of unscheduled electricity supply interruptions by type of interruptions (excluding high voltage interruptions)

KATEGORI • *CATEGORY*	**Voltan rendah** *Low voltage*	**Voltan sederhana** *Medium voltage*	**Jumlah pada 2016** *Total in 2016*
Alat ubah *Transformer*	n/a	61	61
Auto reclose	n/a	4	4
Banjir *Flood*	27	1	28
Feeder pillar	3,139	n/a	3,139
Fius *Fuse*	4,099	4	4,103
Haiwan *Animal*	667	238	905
Insulating piercing connectors (IPC)	16,292	n/a	16,292
Jumper	n/a	18	18
Kabel *Cable*	1,482	1,723	3,205
Konduktor *Conductor*	6,728	412	7,140
Kotak fius *Fuse box*	5,406	14	5,420
Lain-lain *Others*	29	20	49
Null	n/a	205	205
Pautan *Link*	24	2	26
Penamatan *Termination*	159	103	262
Penebat *Insulator*	n/a	14	14
Peralatan suis *Switchgear*	n/a	93	93
Pihak ketiga *Third party*	2,382	993	3,375
Pokok *Tree*	6,106	134	6,240
Relay	n/a	9	9
Ribut *Storm*	147	27	174
Sambungan *Joint*	70	4,029	4,099
Tiang *Pole*	1,404	23	1,427
Ubahtika *Transient*	n/a	76	76
Vandalisme *Vandalism*	354	45	399
JUMLAH *TOTAL*	**48,515**	**8,248**	**56,763**

Jadual 48: *System average interruption duration index* (SAIDI) mengikut tahap voltan
Table 48: System average interruption duration index (SAIDI) by voltage level

TAHAP VOLTAN • *VOLTAGE LEVEL*	**Minit/Pelanggan/Tahun** • *Minutes/Customer/Year*				
	2012	**2013**	**2014**	**2015**	**2016**
Voltan tinggi (66 kV dan ke atas) *High voltage (66 kV and above)*	6.87	0.11	2.64	1.05	0.38
Voltan sederhana (6.6 kV – 33 kV) *Medium voltage (6.6 kV – 33 kV)*	49.30	56.20	50.84	47.78	46.46
Voltan rendah (1 kV dan ke bawah) *Low voltage (1 kV and below)*	4.29	4.04	3.16	2.66	2.45
JUMLAH *TOTAL*	**60.46**	**60.35**	**56.65**	**51.49**	**49.29**

Jadual 49: *System average interruption duration index* (SAIDI) mengikut negeri
Table 49: System average interruption duration index (SAIDI) by State

NEGERI • *STATE*	**2012**	**2013**	**2014**	**2015**	**2016**
Johor	61.77	70.84	57.98	58.98	49.39
Kedah	81.36	74.38	84.34	57.42	60.82
Kelantan	72.35	69.61	56.23	56.18	67.90
Kuala Lumpur	33.69	35.85	32.96	32.36	32.39
Melaka	45.64	38.11	45.27	42.48	38.04
N. Sembilan	54.6	69.96	53.79	56.86	51.03
P. Pinang	73.29	68.89	50.4	54.49	51.05
Pahang	62.15	63.70	68.94	62.61	57.22
Perak	83.61	78.95	69.04	51.64	46.23
Perlis	35.24	36.79	38.94	34.09	35.98
Putrajaya / Cyberjaya	8.48	0.99	0.17	0.63	0.13
Selangor	56.69	54.42	55.84	50.74	54.67
Terengganu	50.29	44.64	43.33	41.46	39.65
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**60.46**	**60.35**	**56.65**	**51.49**	**49.29**

Jadual 50: *System average interruption frequency index* (SAIFI) mengikut tahap voltan
Table 50: System average interruption frequency index (SAIFI) by voltage level

TAHAP VOLTAN • *VOLTAGE LEVEL*	Bilangan Gangguan/Pelanggan/Tahun *Number of Interruptions/Customer/Year*				
	2012	2013	2014	2015	2016
Voltan tinggi (66 kV dan ke atas) *High voltage (66 kV and above)*	0.01	0.00	0.00	0.02	0.02
Voltan sederhana (6.6 kV – 33 kV) *Medium voltage (6.6 kV – 33 kV)*	0.80	0.87	0.92	0.79	0.87
Voltan rendah (1 kV dan ke bawah) *Low voltage (1 kV and below)*	0.00	0.00	0.00	0.02	0.01
JUMLAH *TOTAL*	**0.81**	**0.87**	**0.92**	**0.83**	**0.90**

Jadual 51: *System average interruption frequency index* (SAIFI) mengikut negeri
Table 51: System average interruption frequency index (SAIFI) by state

NEGERI • *STATE*	Bilangan Gangguan/Pelanggan/Tahun *Number of Interruptions/Customer/Year*				
	2012	2013	2014	2015	2016
Johor	0.12	0.94	0.83	0.70	0.70
Kedah	0.29	1.11	1.65	1.20	1.40
Kelantan	0.24	1.26	1.21	1.25	1.45
Kuala Lumpur	0.03	0.37	0.67	0.48	0.57
Melaka	0.15	0.56	0.71	0.58	0.64
N. Sembilan	0.10	0.73	0.78	0.77	0.78
P. Pinang	0.16	1.00	0.81	0.83	0.82
Pahang	0.19	1.42	1.49	1.44	1.56
Perak	0.21	1.10	1.08	0.8	0.94
Perlis	0.05	0.47	0.43	0.46	0.57
Putrajaya / Cyberjaya	0.00	0.01	0.08	0.01	0.15
Selangor	0.12	0.76	0.74	0.74	0.84
Terengganu	0.16	1.03	1.05	0.87	1.01
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**0.81**	**0.87**	**0.92**	**0.83**	**0.90**

Jadual 52: *Customer average interruption duration index* (CAIDI) mengikut tahap voltan
Table 52: Customer average interruption duration index (CAIDI) by voltage level

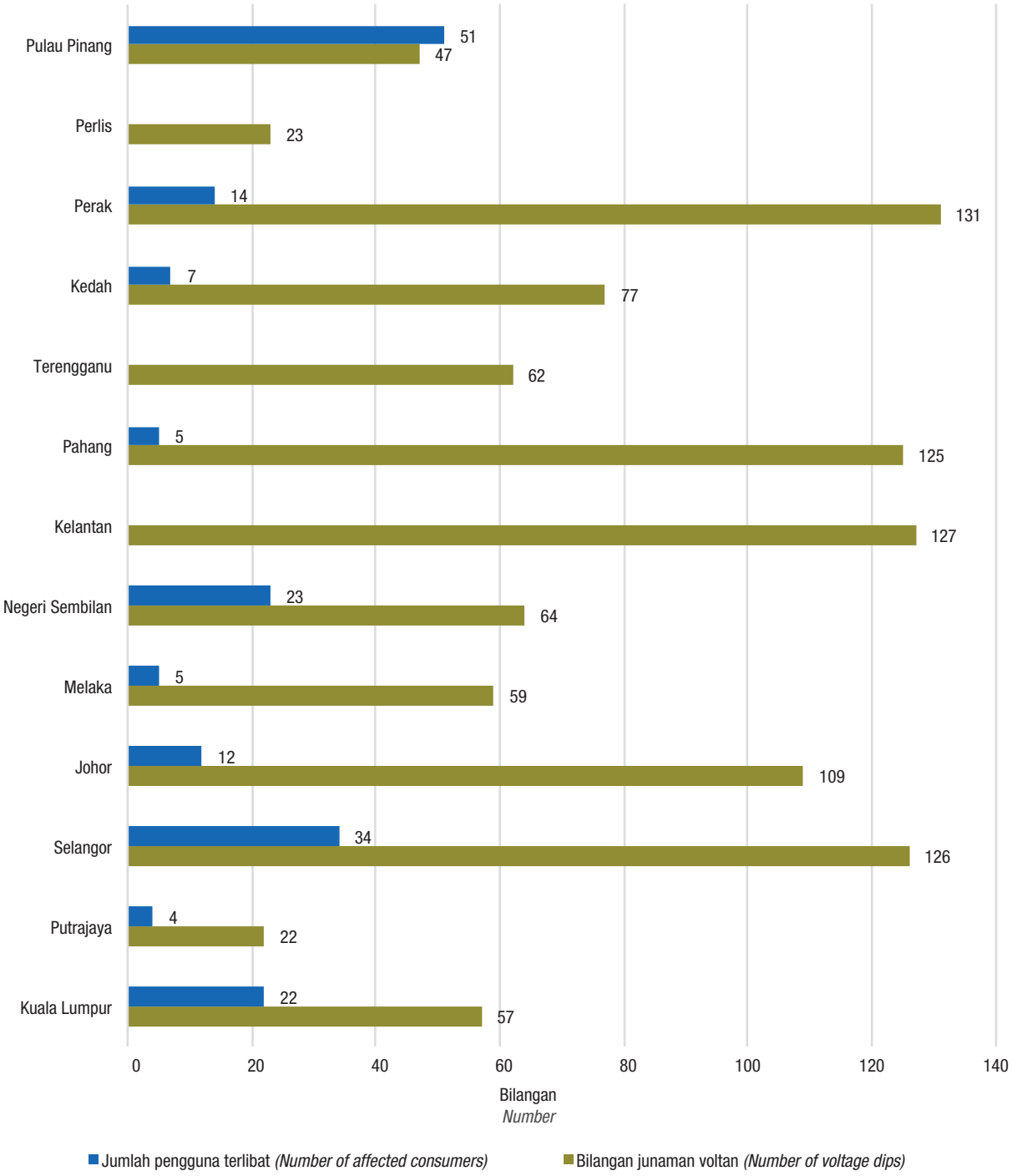
TAHAP VOLTAN • *VOLTAGE LEVEL*	Minit/ Pelanggan Terlibat/Tahun *Minutes/Affected Customer/Year*				
	2012	2013	2014	2015	2016
Voltan tinggi (66 kV dan ke atas) *High voltage (66 kV and above)*	687.00	0.00	0.00	52.50	19.00
Voltan sederhana (6.6 kV – 33 kV) *Medium voltage (6.6 kV – 33 kV)*	61.63	64.60	55.26	60.48	53.40
Voltan rendah (1 kV dan ke bawah) *Low voltage (1 kV and below)*	429.00	403.00	316.00	133.00	245.00
JUMLAH *TOTAL*	**74.64**	**69.37**	**61.58**	**62.04**	**54.77**

Jadual 53: *Customer average interruption duration index* (CAIDI) mengikut negeri
Table 53: Customer average interruption duration index (CAIDI) by state

NEGERI • *STATE*	**Minit/ Pelanggan Terlibat/Tahun** *Minutes/Affected Customer/Year*				
	2012	**2013**	**2014**	**2015**	**2016**
Johor	73.07	75.36	69.86	84.26	70.56
Kedah	47.45	67.01	51.12	47.85	43.44
Kelantan	54.80	55.25	46.47	44.94	46.83
Kuala Lumpur	98.59	96.89	49.19	67.42	56.82
Melaka	73.74	68.05	63.76	73.24	59.44
N. Sembilan	82.21	95.84	68.96	73.84	65.42
P. Pinang	67.06	68.89	62.22	65.65	62.26
Pahang	57.46	44.86	46.27	43.48	36.68
Perak	66.52	71.77	63.93	64.55	49.18
Perlis	72.67	78.28	90.56	74.11	63.12
Putrajaya / Cyberjaya	35.78	99.00	2.13	63.00	0.87
Selangor	66.77	71.61	75.46	68.57	65.08
Terengganu	49.12	43.34	41.27	47.66	39.26
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**74.64**	**69.37**	**61.58**	**62.04**	**54.77**

KUALITI PEMBEKALAN ELEKTRIK TNB
TNB ELECTRICITY SUPPLY QUALITY

Carta 9: Kejadian junaman voltan mengikut negeri dan bilangan pengguna yang terlibat
Chart 9: Voltage dip incidents by state and number of consumers involved



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 54: Bilangan pengguna TNB terlibat dengan insiden junaman voltan mengikut negeri
Table 54: TNB number of consumers involved in voltage dip incidents by state

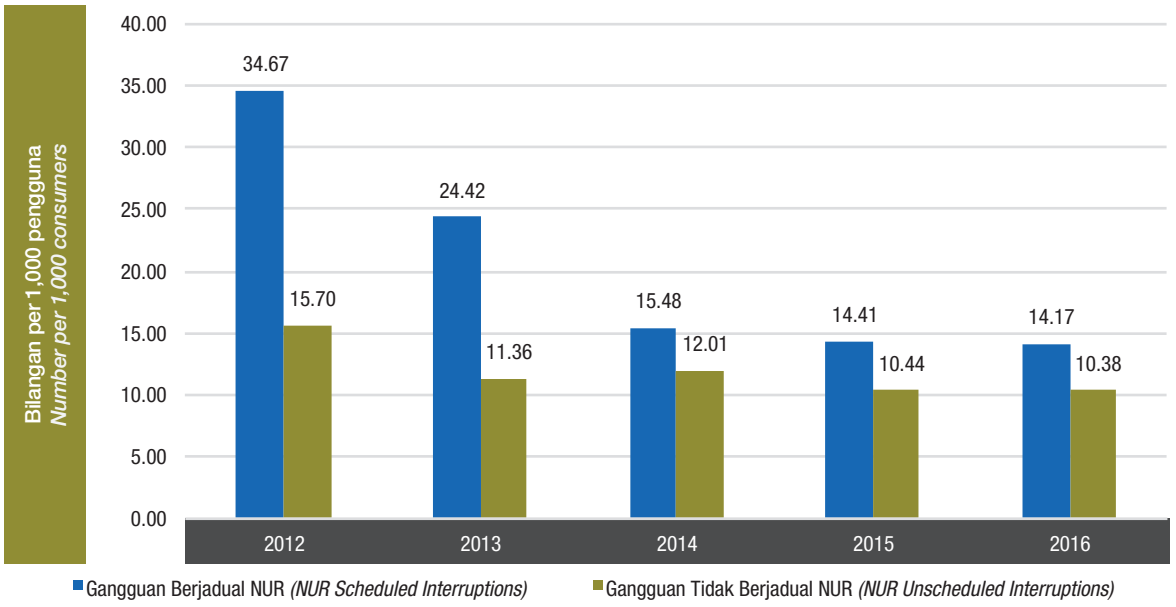
NEGERI • *STATE*	2012	2013	2014	2015	2016
Johor	7	4	20	17	12
Kedah	0	2	5	11	7
Kelantan	0	1	3	0	-
Melaka	2	3	3	9	5
Negeri Sembilan	3	6	17	16	23
Pahang	1	7	4	4	5
Perak	5	3	7	20	14
Perlis	0	0	0	0	-
P. Pinang	7	27	29	64	51
Selangor	16	28	33	36	34
Terengganu	1	2	2	1	-
WP Kuala Lumpur	6	8	10	26	22
WP Putrajaya / Cyberjaya	0	2	19	5	4
SEMENANJUNG MALAYSIA *PENINSULAR MALAYSIA*	**48**	**93**	**152**	**209**	**177**

Jadual 55: *System average RMS frequency index* (SARFI)
Table 55: System average RMS frequency index (SARFI)

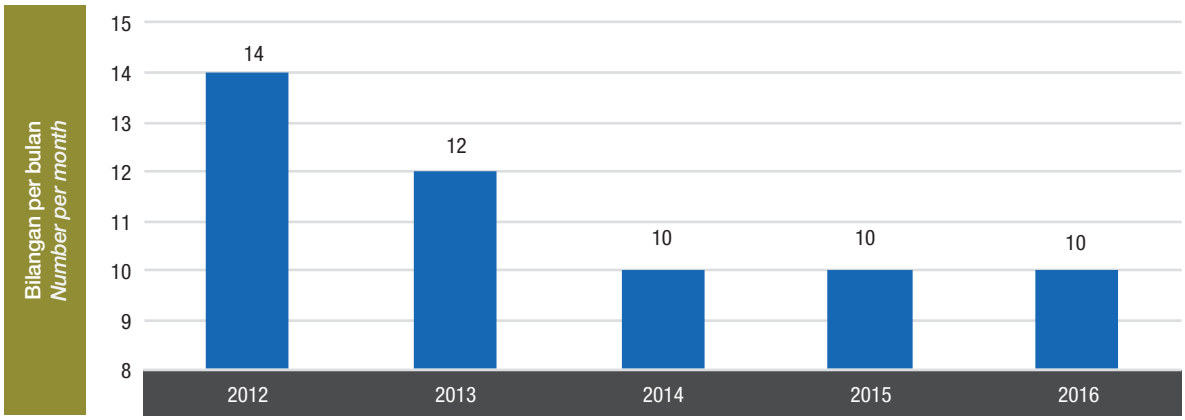
SISTEM TNB • *TNB SYSTEM*	2016		
	$SARFI_{90}$	$SARFI_{80}$	$SARFI_{70}$
11 kV	6.05	3.48	2.03
22 kV	6.00	3.86	3.43
33 kV	6.86	2.8	1.36
SISTEM KESELURUHAN *OVERALL SYSTEM*	**5.84**	**2.97**	**1.80**

SISTEM PENGAGIHAN NUR DISTRIBUTION SDN. BHD. (NUR)
NUR DISTRIBUTION SDN. BHD. (NUR) DISTRIBUTION SYSTEM

Carta 10: Gangguan bekalan elektrik per 1,000 pengguna NUR
Chart 10: NUR electricity supply interruptions per 1,000 consumers



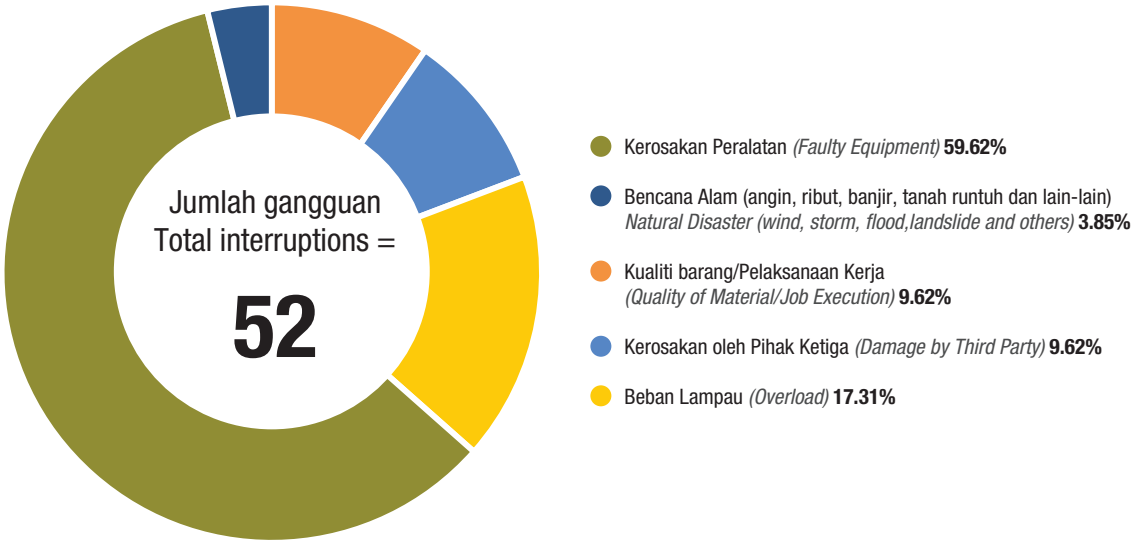
Carta 11: Purata gangguan bekalan elektrik bulanan NUR
Chart 11: NUR monthly average electricity supply interruptions



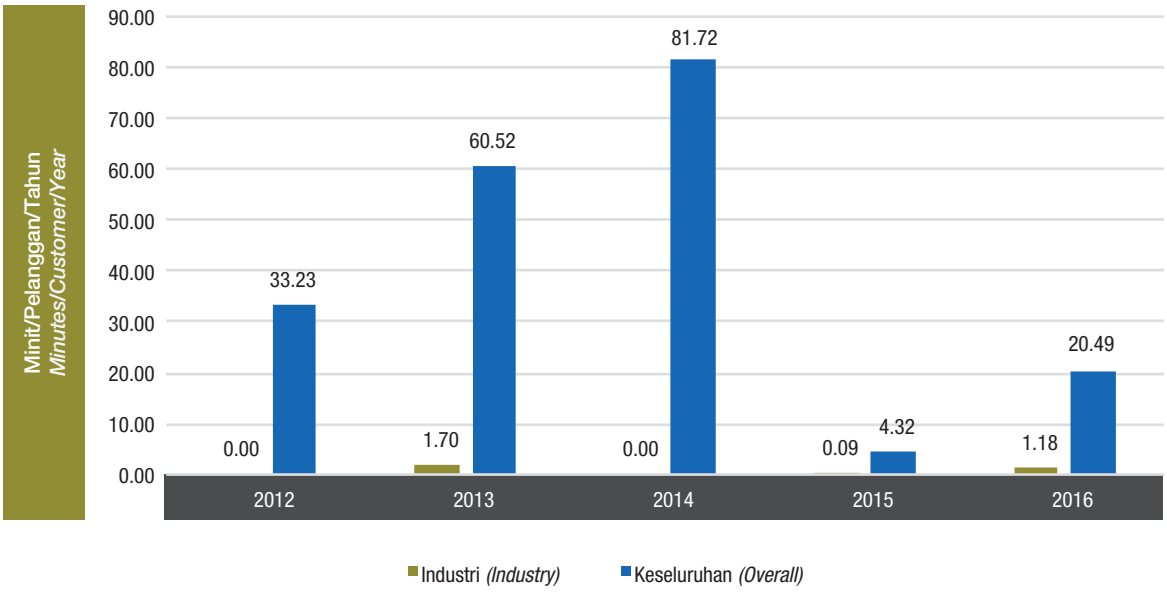
Jadual 56: Bilangan gangguan bekalan elektrik NUR
Table 56: NUR number of electricity supply interruptions

BILANGAN • *NUMBER*	**2012**	**2013**	**2014**	**2015**	**2016**
Gangguan tidak berjadual *Unscheduled interruptions*	53	47	52	50	52
Gangguan berjadual *Scheduled interruptions*	117	101	67	69	71
JUMLAH *TOTAL*	**170**	**148**	**119**	**119**	**123**

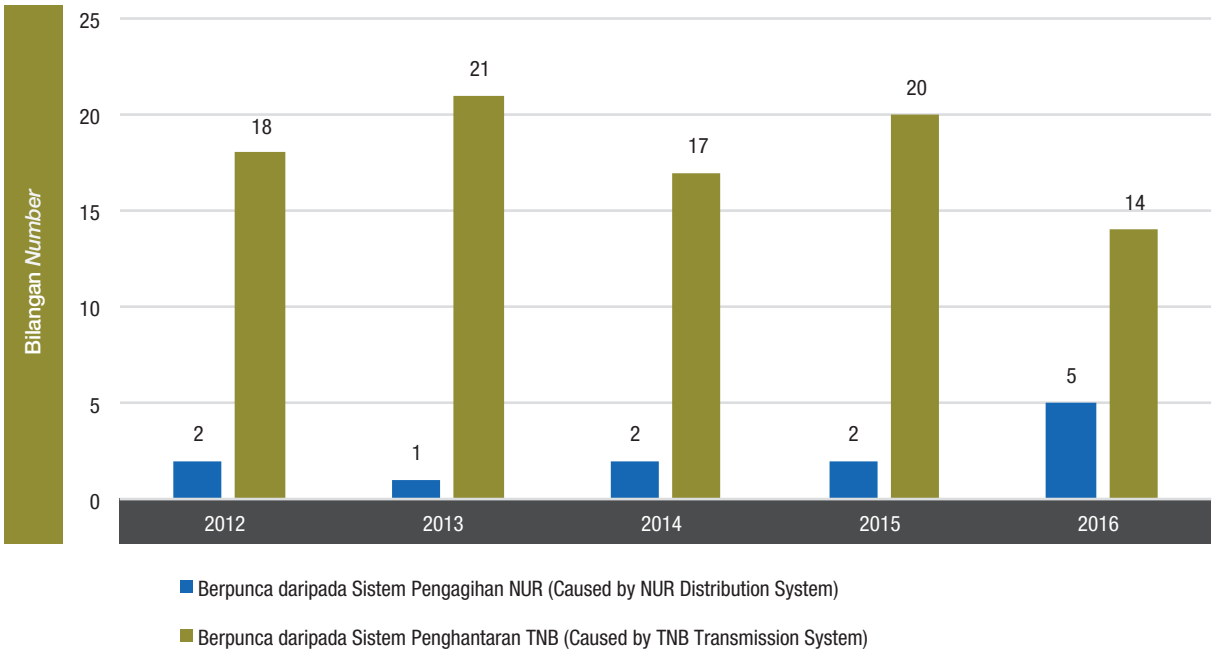
Carta 12: Gangguan bekalan elektrik tidak berjadual NUR mengikut jenis
Chart 12: NUR unscheduled supply interruption by type



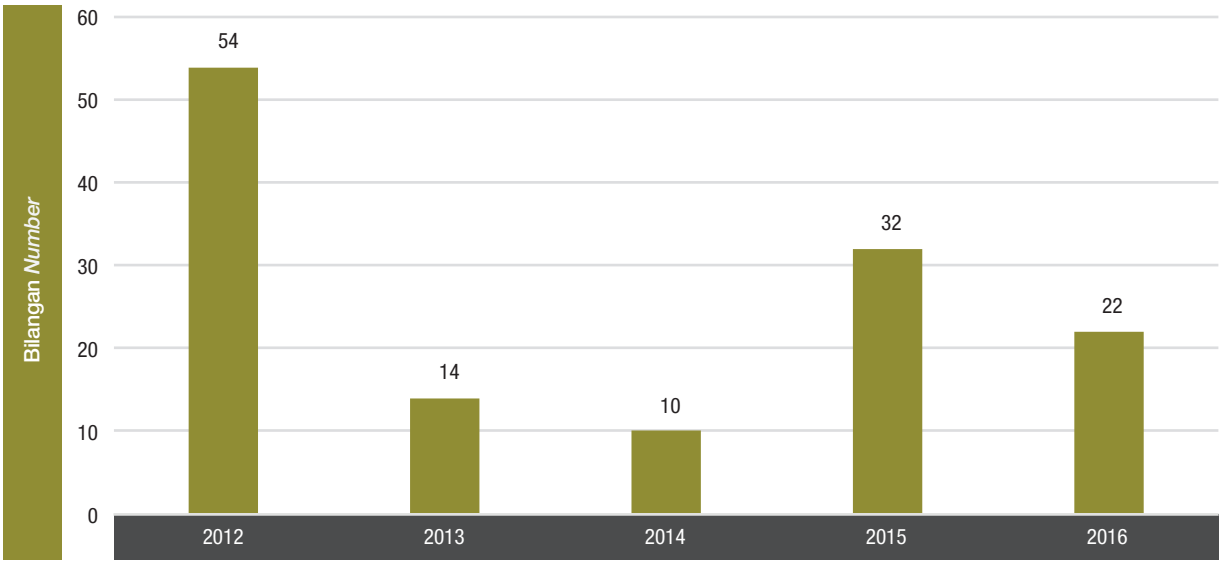
Carta 13: *System average interruption duration index* (SAIDI) NUR
Chart 13: System average interruption duration index (SAIDI) NUR



Carta 14: Kejadian junaman voltan yang dilaporkan di KHTP
Chart 14: Reported voltage dips incidents in KHTP

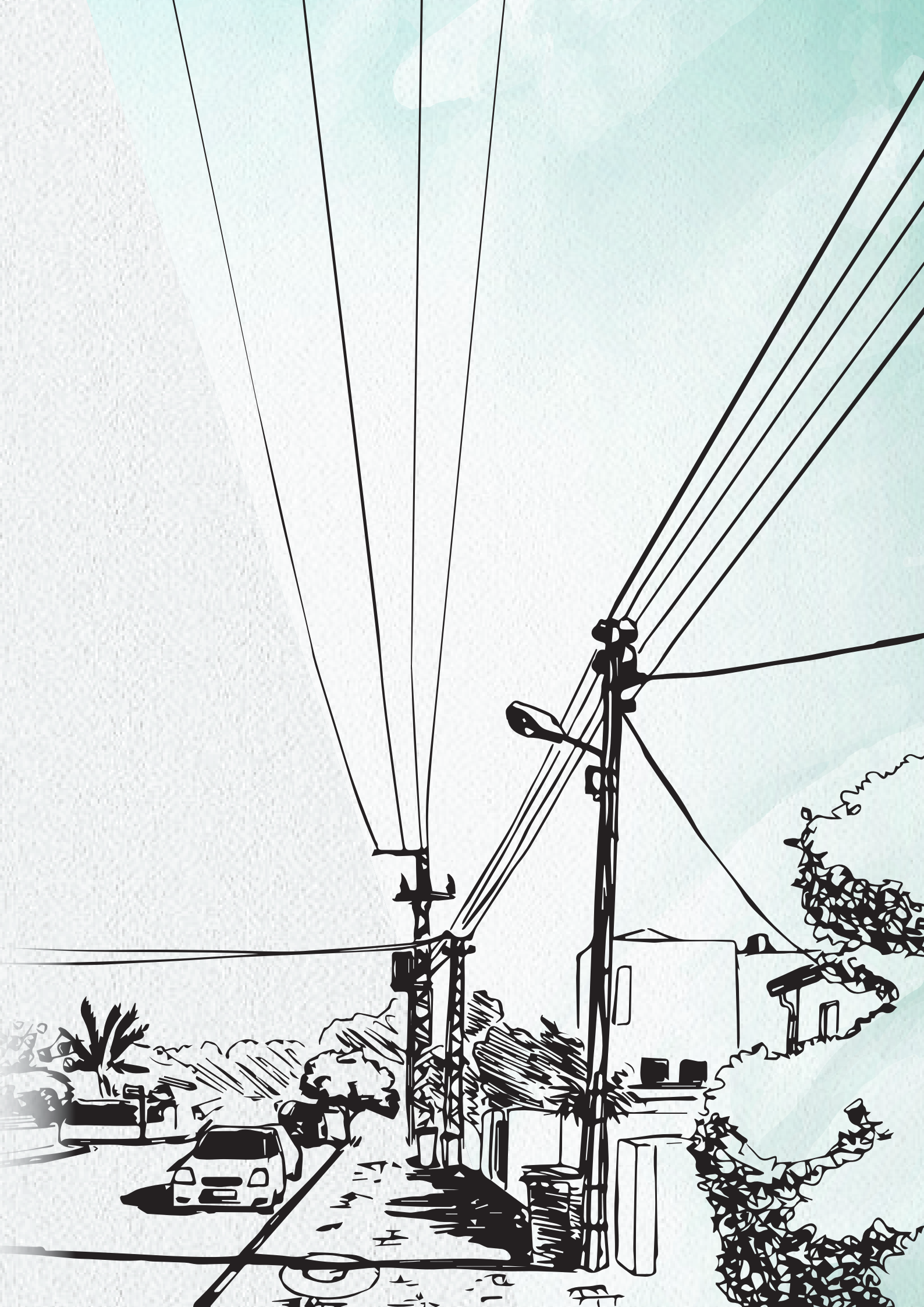


Carta 15: Bilangan pengguna NUR terlibat dengan insiden junaman voltan
Chart 15: NUR number of consumers involved in voltage dip incidents



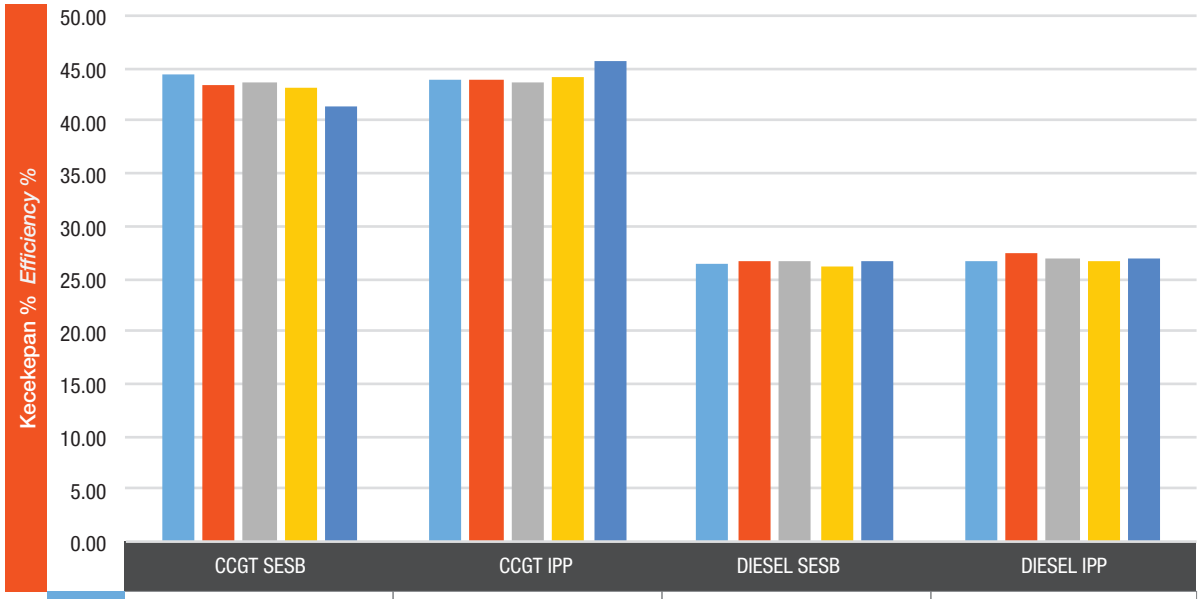
Sabah

Maklumat Prestasi
Performance Information



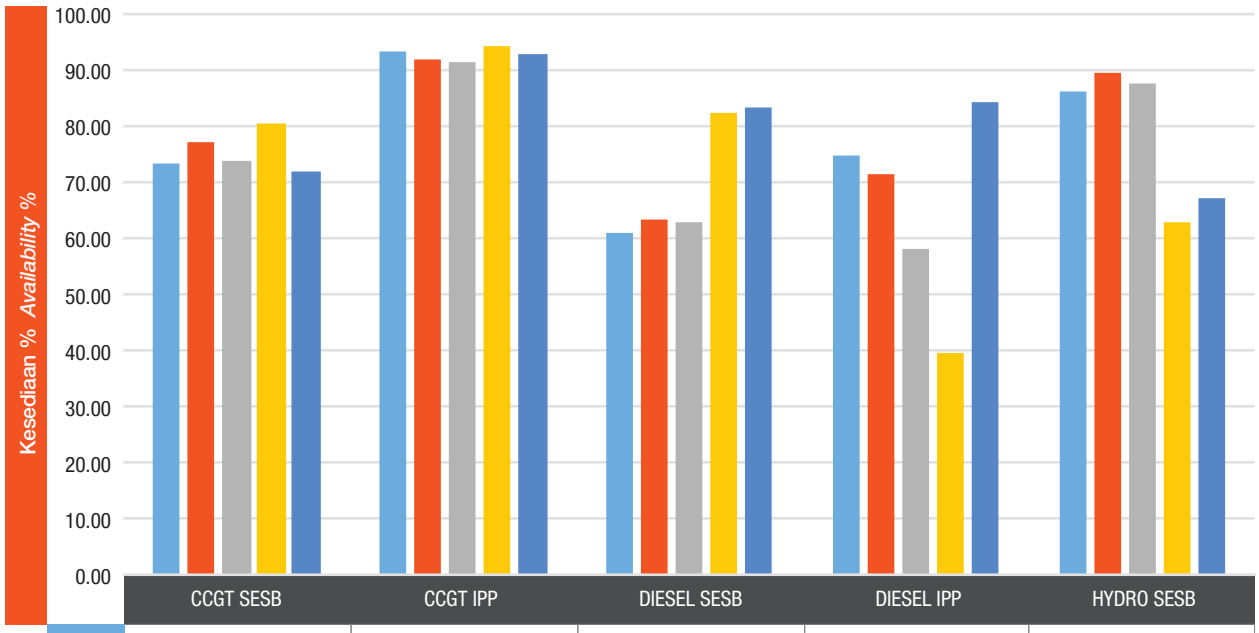
SISTEM PENJANAAN SESB DAN PENJANA-PENJANA BEBAS DI SABAH
GENERATION SYSTEM OF SESB AND INDEPENDENT POWER PRODUCERS IN SABAH

Carta 16: Purata kecekapan *thermal* mengikut jenis loji jana kuasa
Chart 16: Average thermal efficiency by type of power plants



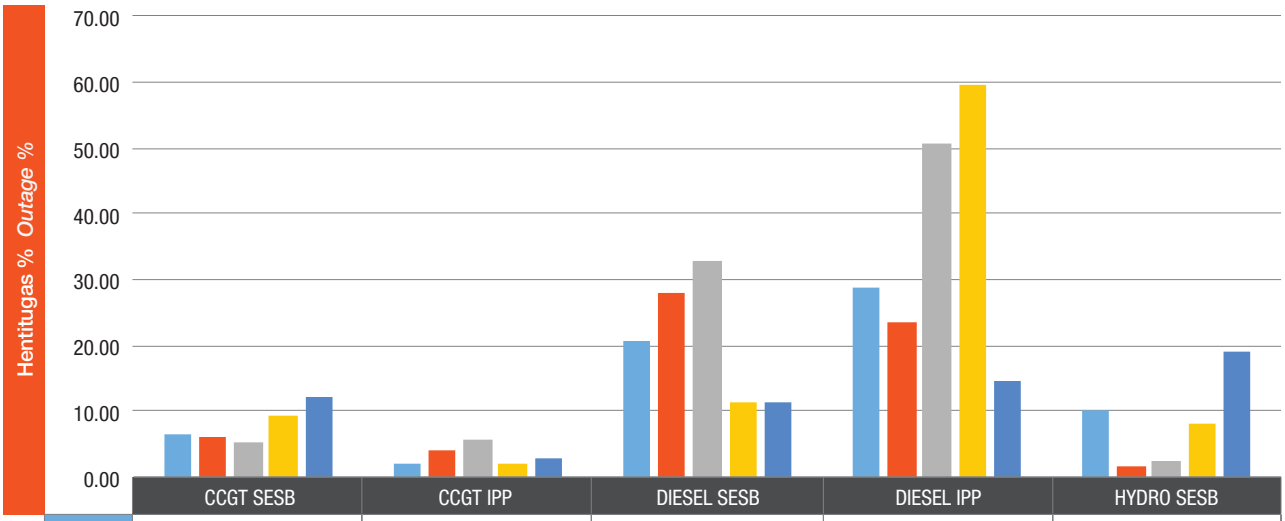
	CCGT SESB	CCGT IPP	DIESEL SESB	DIESEL IPP
2012	44.34	43.96	26.29	26.77
2013	43.30	44.00	26.70	27.40
2014	43.63	43.66	26.70	26.93
2015	43.14	44.24	26.23	26.61
2016	41.49	45.65	26.55	26.82

Carta 17: Purata faktor kesediaan setara (EAF) mengikut jenis loji jana kuasa
Chart 17: Average equivalent availability factor (EAF) by type of power plants



	CCGT SESB	CCGT IPP	DIESEL SESB	DIESEL IPP	HYDRO SESB
2012	73.43	93.32	60.76	74.57	86.23
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

Carta 18: Purata faktor henti tugas tidak berjadual setara (EUOF) mengikut jenis loji jana kuasa
Chart 18: Average equivalent unplanned outage factor (EUOF) by type of power plants



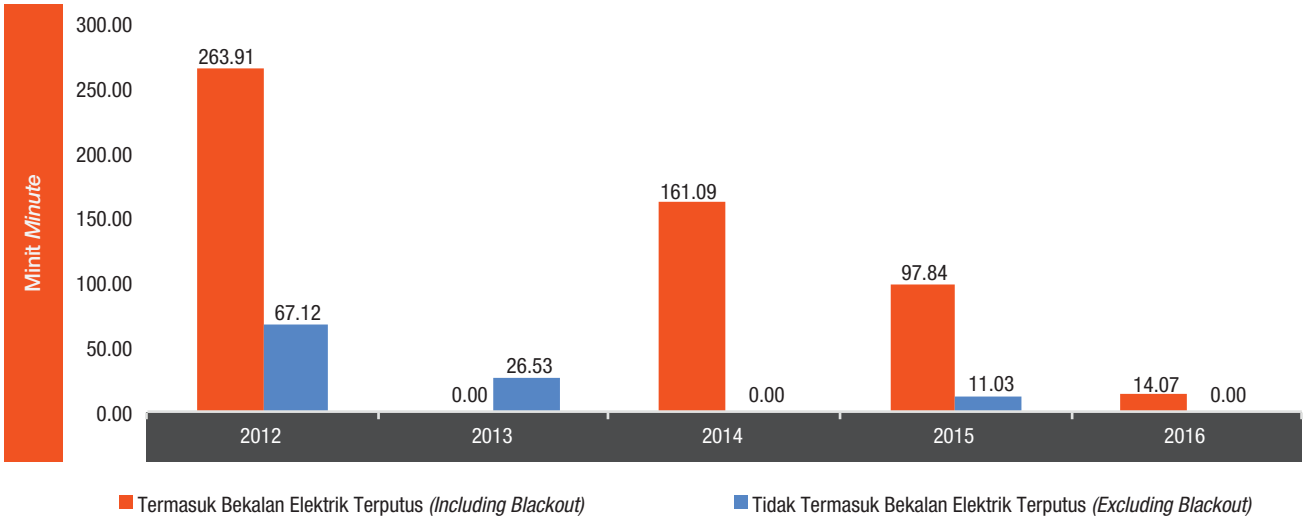
	CCGT SESB	CCGT IPP	DIESEL SESB	DIESEL IPP	HYDRO SESB
2012	6.59	1.88	20.77	28.81	10.34
2013	6.11	4.24	27.91	23.66	1.71
2014	5.37	5.77	32.75	50.72	2.38
2015	9.42	2.05	11.55	59.56	8.17
2016	12.27	2.74	11.31	14.79	19.23

SISTEM PENGHANTARAN SESB
SESB TRANSMISSION SYSTEM

Jadual 57: Pelantikan sistem penghantaran dengan kehilangan beban sebanyak 50 MW dan ke atas
Table 57: Transmission system trippings with load loss of 50 MW and above

Petunjuk • *Indicator*	JAN	FEB	MAC / MAR	APR	MEI / MAY	JUN / JUNE	JUL / JULY	OGOS / AUG	SEPT	OKT / OCT	NOV	DIS / DEC
Bilangan pelantikan tanpa lucutan beban *Number of trippings without load shedding*	-	-	-	-	-	-	-	-	-	-	-	-
Bilangan pelantikan dengan lucutan beban *Number of trippings with load shedding*	-	-	-	-	1	-	-	-	-	-	-	-
Kehilangan beban maksimum (MW) *Maximum load losses (MW)*	-	-	-	-	78.7	-	-	-	-	-	-	-
Tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Unsupplied energy during trippings (MWh)*	-	-	-	-	32.8	-	-	-	-	-	-	-
Purata tenaga tidak dibekalkan setiap pelantikan (MWj) *Average unsupplied energy during trippings (MWh)*	-	-	-	-	32.8	-	-	-	-	-	-	-
Purata tempoh setiap pelantikan (jam: minit) *Average duration per tripping (hour: minutes)*	-	-	-	-	0:25	-	-	-	-	-	-	-
Tenaga tidak dibekalkan semasa lucutan beban (MWj) *Unsupplied energy during load shedding (MWh)*	-	-	-	-	32.8	-	-	-	-	-	-	-

Carta 19: *Delivery point unreliability index* (DePUI) - *system minutes* SESB
Chart 19: Delivery point unreliability index (DePUI) - SESB system minutes



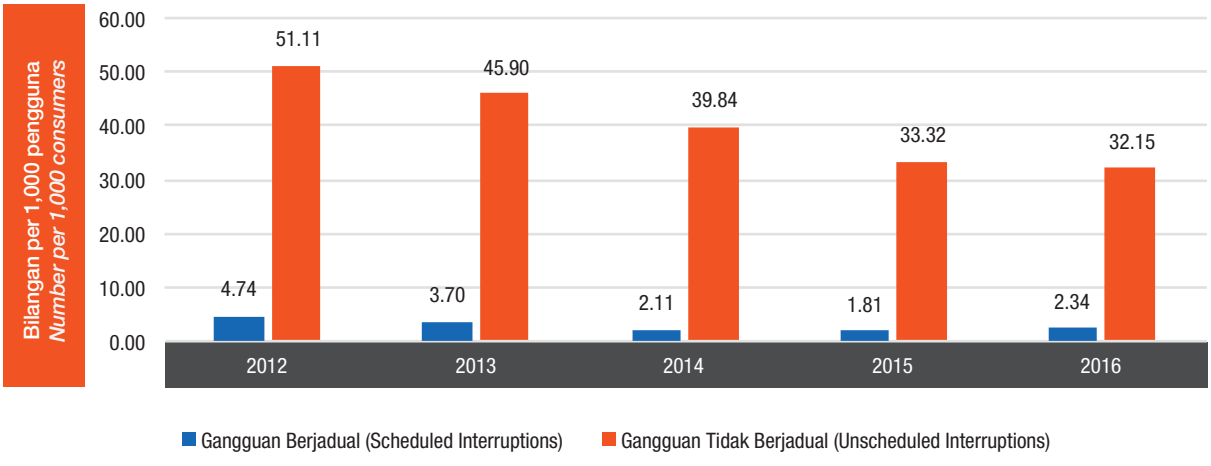
Nota • *Notes:*
1. Data tahun kewangan *Financial year data*
2. Termasuk 5 insiden besar pada tahun 2012 *Including 5 major incidents in 2012*

Jadual 58: Insiden pelantikan bagi talian/kabel per 100 cct-km mengikut tahap voltan (dengan kehilangan beban)
Table 58: Tripping incidents for lines/cables per 100 cct-km by voltage level (with load loss)

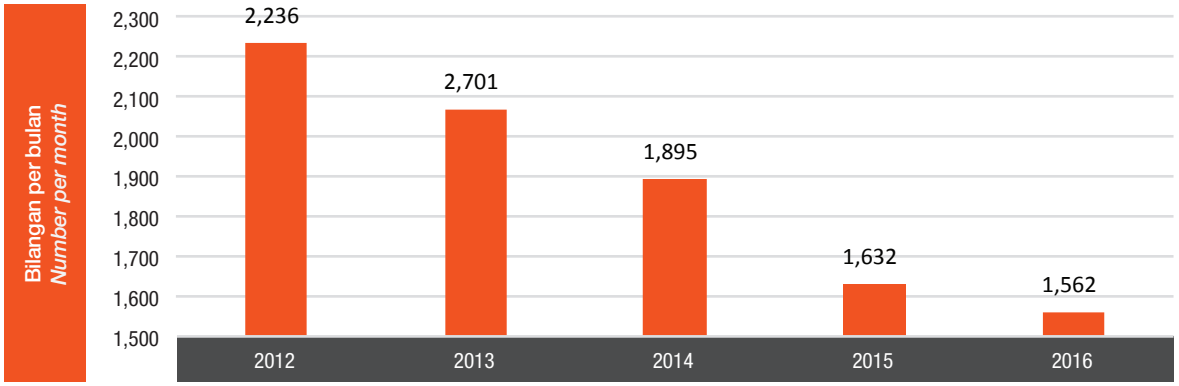
TAHAP VOLTAN • *VOLTAGE LEVEL*	**2012**	**2013**	**2014**	**2015**	**2016**
275 kV	0	0	0	0	0
132 kV	1.08	0.42	0.58	0.99	0.31
66 kV	5.56	4.46	0.00	5.89	4.21

SISTEM PENGAGIHAN SESB
SESB DISTRIBUTION SYSTEM

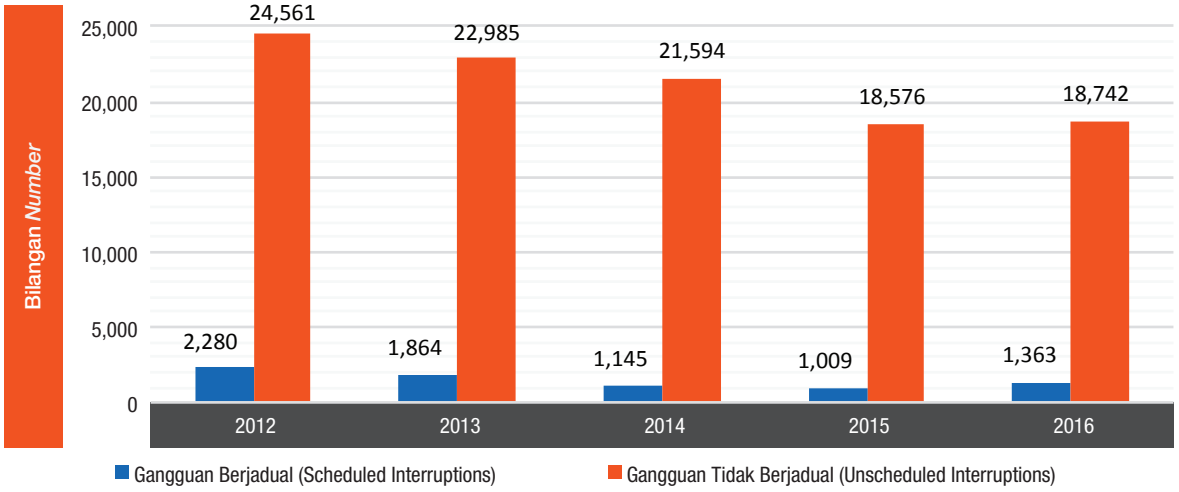
Carta 20: Gangguan bekalan elektrik per 1,000 pengguna SESB
Chart 20: SESB electricity supply interruptions per 1,000 consumers



Carta 21: Purata gangguan bekalan elektrik bulanan SESB
Chart 21: SESB monthly average electricity supply interruptions



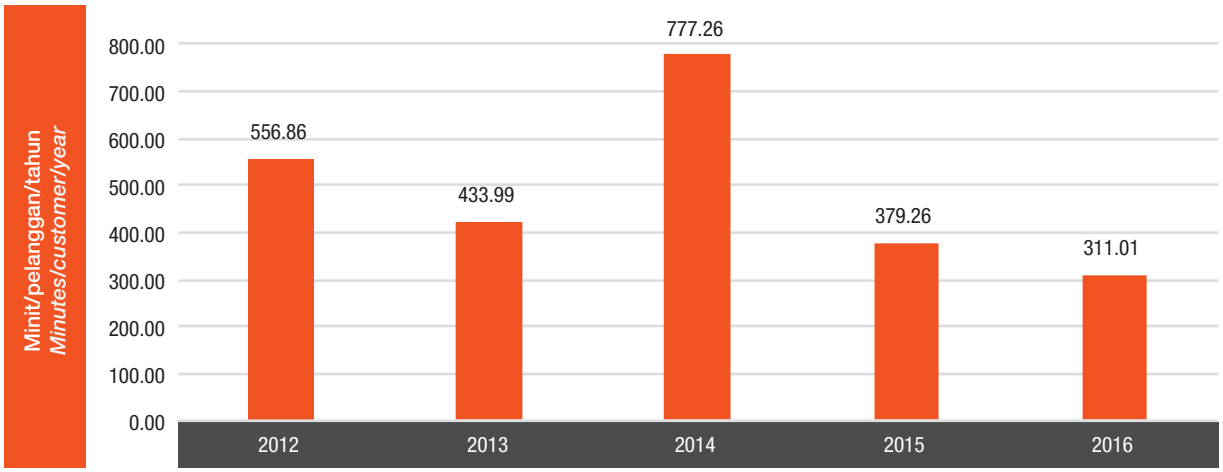
Carta 22: Bilangan gangguan bekalan elektrik SESB
Chart 22: SESB number of electricity supply interruptions



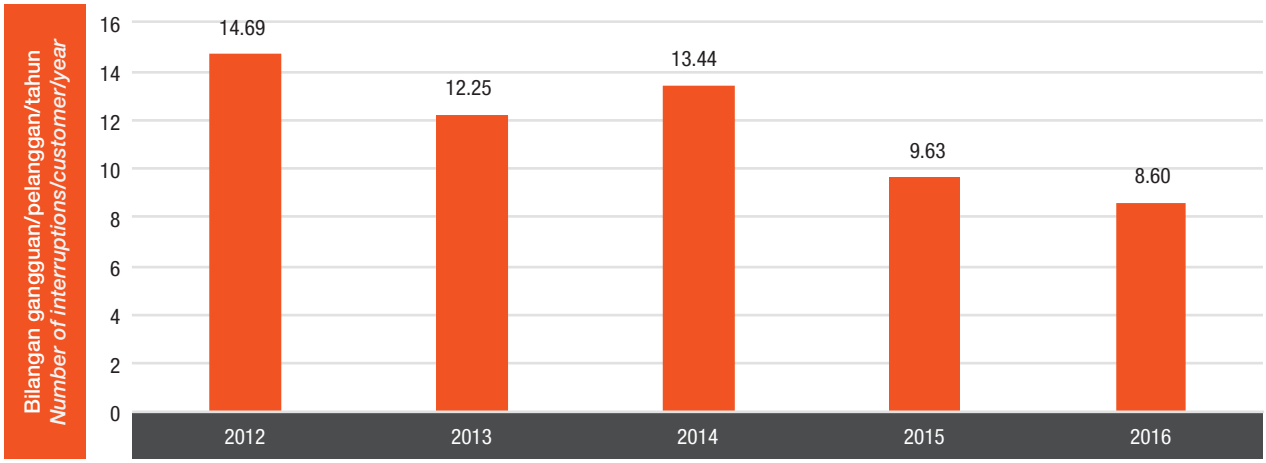
Jadual 59: Gangguan bekalan elektrik tidak berjadual SESB mengikut jenis
Table 59: SESB number of unscheduled electricity supply interruptions by type

JENIS GANGGUAN *TYPE OF INTERRUPTIONS*	2012	2013	2014	2015	2016
Banjir *Flood*	5	16	16	7	3
Beban lampau *Overload*	2,675	3,444	3,317	2,209	2,929
Binatang *Animal*	1,930	1,451	1,445	1,171	977
Contact tidak baik *Poor contact*	3,326	3,224	2,977	3,168	2,959
Cuaca buruk (angin, ribut, petir) *Bad weather (wind, storm, lightning)*	3,159	2,416	2,185	1,415	1,191
Disebabkan oleh pihak lain (kena langgar, khianat, kena curi dan penyambungan haram) *Caused by other parties (hit, treachery, theft and illegal connection)*	1,962	1,521	2,071	1,742	2,195
Kabel *Cable*	566	586	604	483	474
Kebakaran *Fire*	11	16	33	25	64
Kena *guard wire*/ kendur *Touched with guard wire/sagging*	1,203	1,253	1,283	837	792
Kerosakan peralatan *Faulty equipment*	250	380	255	71	82
Kualiti barang *Quality of material*	585	224	176	94	83
Lain-lain (tiada data, tiada operasi, tiada bekalan) *Others (unavailable data, shut down, no supply)*	2,543	0	1,368	2,275	2,968
Lanjut usia / reput *Old/decayed*	929	855	726	1111	595
Pencawang *Substation*	632	666	547	495	441
Pokok *Tree*	4,561	4,542	4,126	3,185	2,370
Tanah runtuh *Landslide*	50	41	104	33	22
Tidak diketahui *Unknown*	0	2,055	0	0	0
Ubahtika *Transient*	174	295	361	255	597
JUMLAH ***TOTAL***	**24,561**	**22,985**	**21,594**	**18,576**	**18,742**

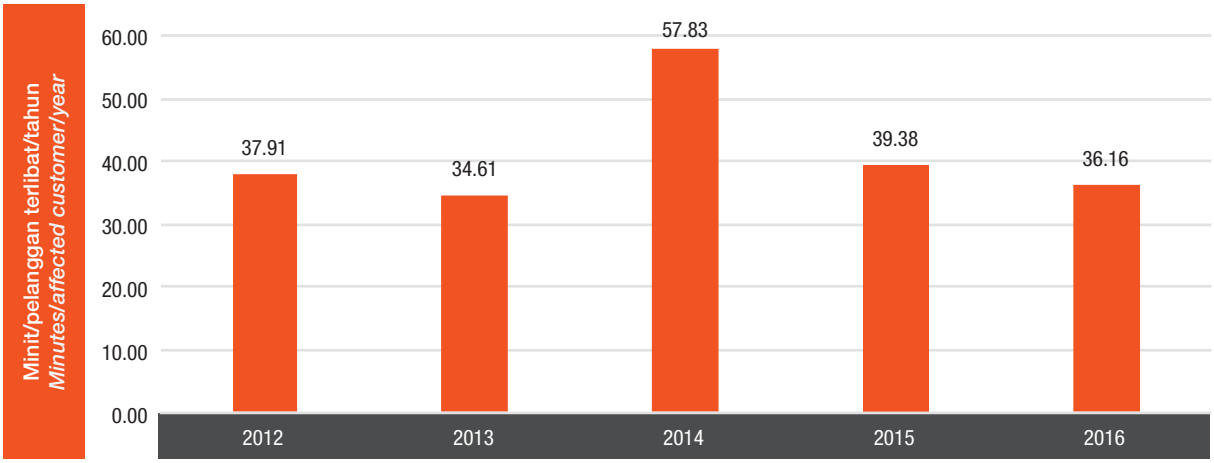
Carta 23: *System average interruption duration index* (SAIDI) SESB
Chart 23: SESB system average interruption duration index (SAIDI)



Carta 24: *System average interruption frequency index* (SAIFI) SESB
Chart 24: SESB system average interruption frequency index (SAIFI)



Carta 25: *Customer average interruption duration index* (CAIDI) SESB
Chart 25: SESB customer average interruption duration index (CAIDI)



Sarawak

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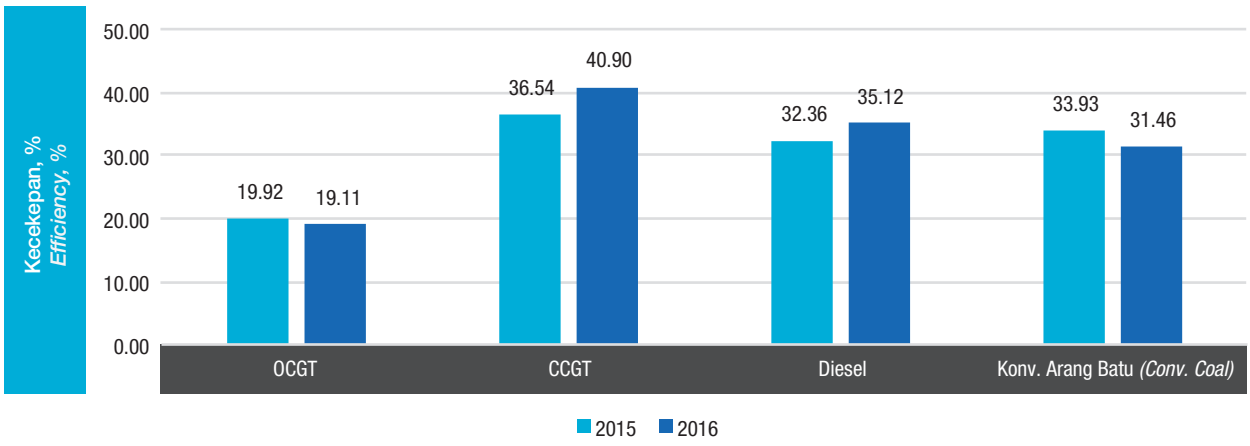
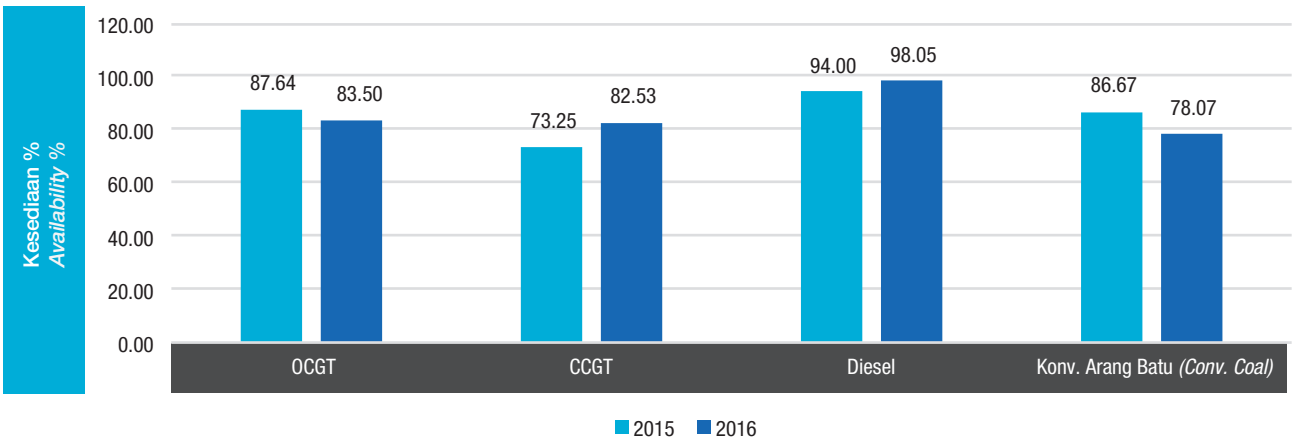
SISTEM PENJAAAN SEB DAN PENJANA-PENJANA BEBAS DI SARAWAK
GENERATION SYSTEM OF SEB AND INDEPENDENT PRODUCERS (IPP) IN SARAWAK

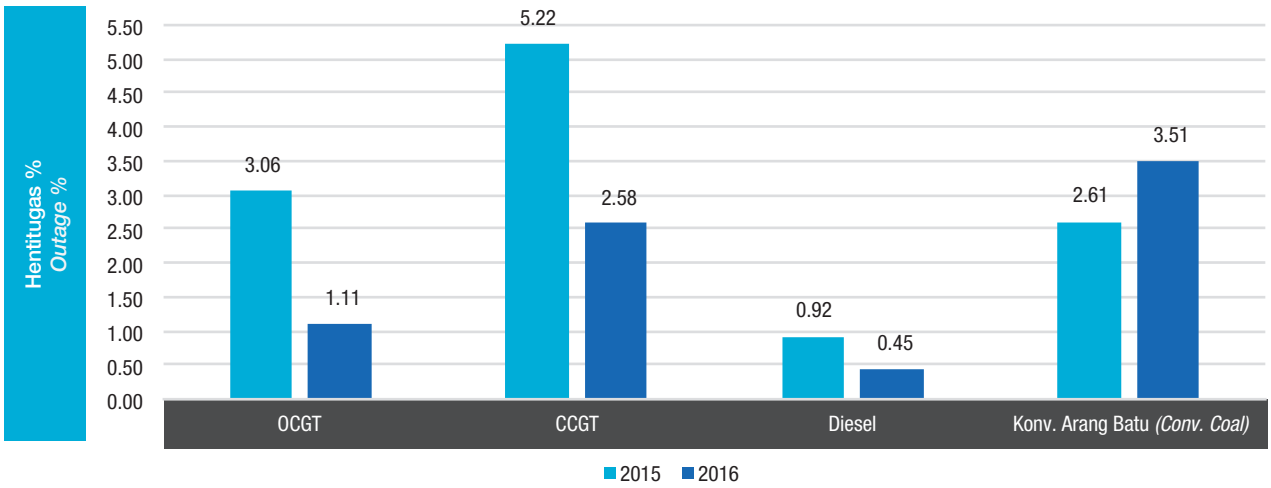
Carta 26: Purata kecekapan *thermal* mengikut jenis loji jana kuasa
Chart 26: Average thermal efficiency by type of power plants



Carta 27: Purata faktor kesediaan setara (EAF) mengikut jenis loji jana kuasa
Chart 27: Average equivalent availability factor (EAF) by type of power plants



Carta 28: Kadar henti tugas tidak berjadual (FOR) mengikut jenis loji jana kuasa
Chart 28: Forced outage rate (FOR) by type of power plants

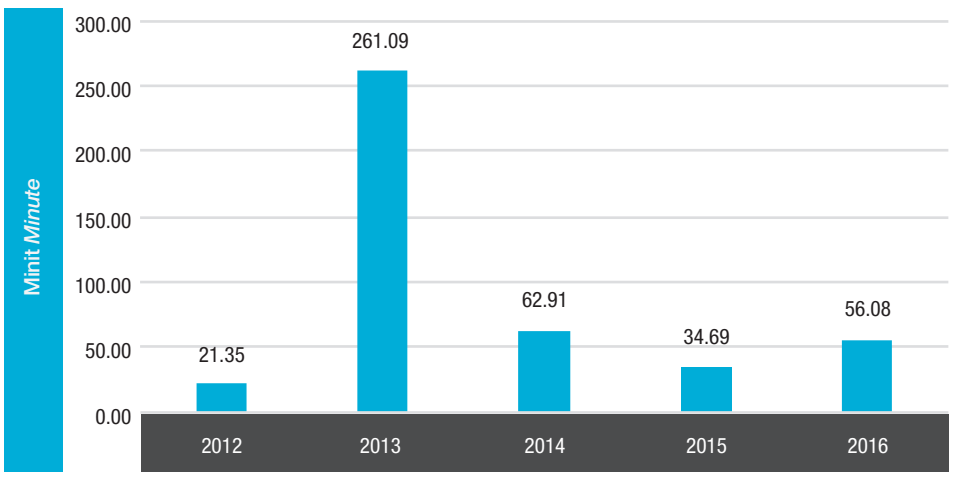


SISTEM PENGHANTARAN SEB
SEB TRANSMISSION SYSTEM

Jadual 60: Pelantikan sistem penghantaran SEB dengan kehilangan beban sebanyak 50 MW dan ke atas
Table 60: SEB transmission system trippings with load loss of 50 MW and above

Petunjuk • *Indicator*	JAN	FEB	MAC	APR	MEI	JUN	JUL	OGOS	SEPT	OKT	NOV	DIS
			MAR		MAY	JUNE	JULY	AUG		OCT		DEC
Bilangan pelantikan tanpa lucutan beban *Number of trippings without load shedding*	3	-	-	2	3	1	1	2	2	1	4	1
Bilangan pelantikan dengan lucutan beban *Number of trippings with load shedding*	-	-	-	-	-	-	-	-	-	-	-	-
Kehilangan beban maksimum (MW) *Maximum load losses (MW)*	869.00	-	-	13.50	7.20	4.00	24.00	42.80	24.80	24.08	1,273.55	17.00
Tenaga yang tidak dibekalkan semasa pelantikan (MWj) *Unsupplied energy during trippings (MWh)*	670.55	-	-	8.96	5.81	3.07	7.20	64.84	35.11	16.05	1,323.17	5.10
Purata tenaga tidak dibekalkan setiap pelantikan (MWj) *Average unsupplied energy during trippings (MWh)*	223.55	-	-	4.48	1.94	3.07	7.20	32.42	17.56	16.05	330.79	5.10
Purata tempoh setiap pelantikan (jam: minit) *Average duration per tripping (hour: minutes)*	57.03	-	-	40.00	68.33	46.00	18.00	92.23	195.00	40.00	60.50	18.00
Tenaga tidak dibekalkan semasa lucutan beban (MWj) *Unsupplied energy during load shedding (MWh)*	-	-	-	-	-	-	-	-	-	-	-	-

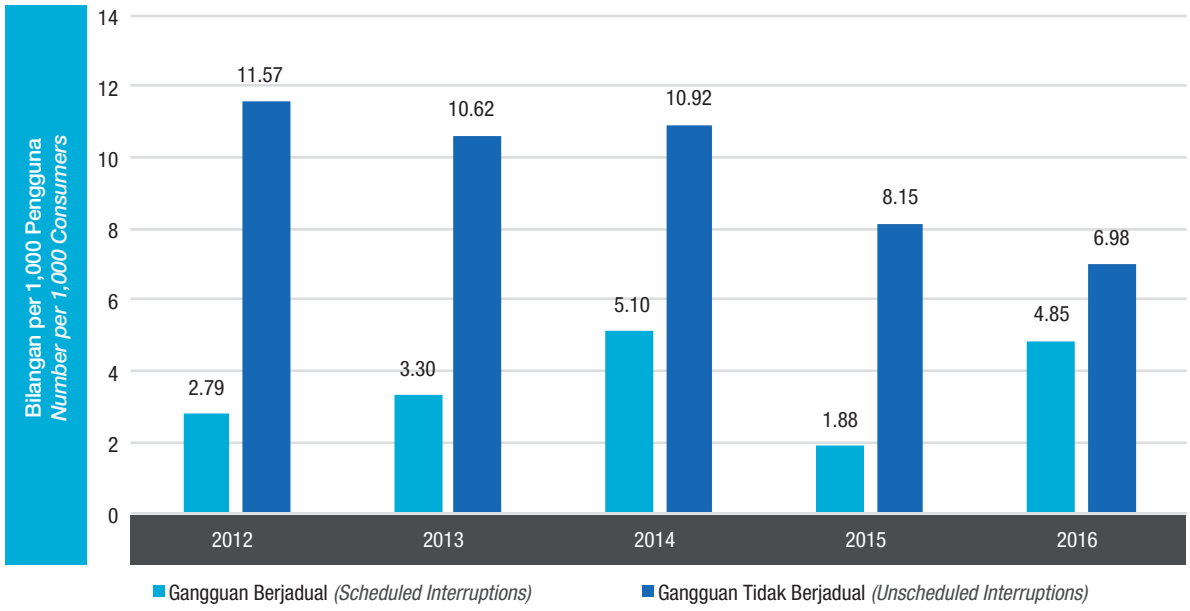
Carta 29: *Delivery point unreliability index* (DePUI) SEB - *system minutes* SEB
Chart 29 : Delivery point unreliability index (DePUI) - SEB system minutes



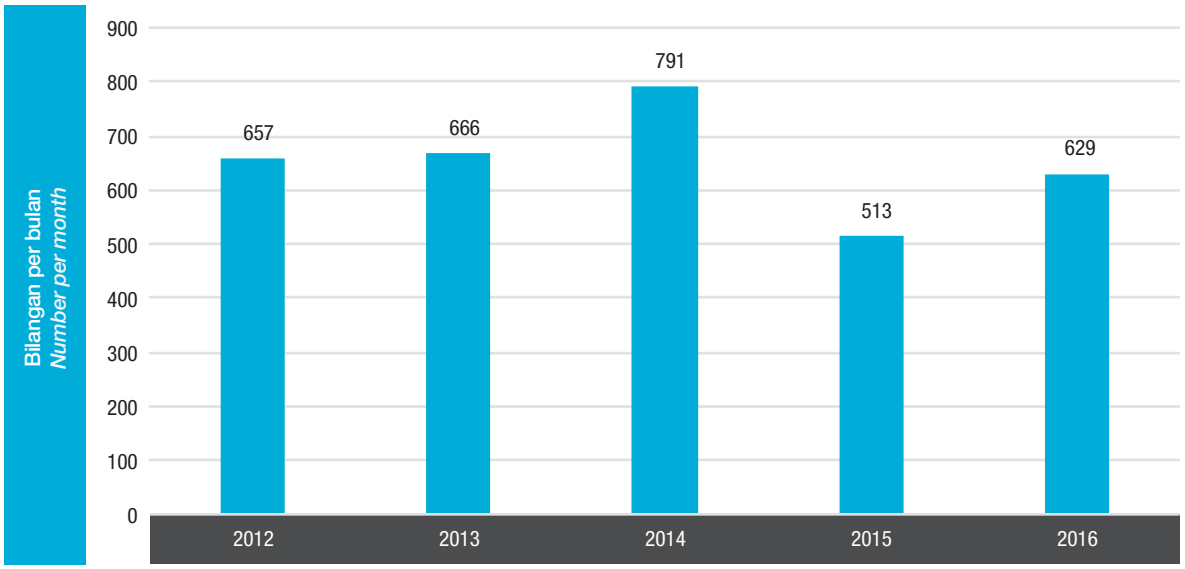
Nota • *Notes:*
Data tahun kewangan *Financial year data*

SISTEM PENGAGIHAN SEB
SEB DISTRIBUTION SYSTEM

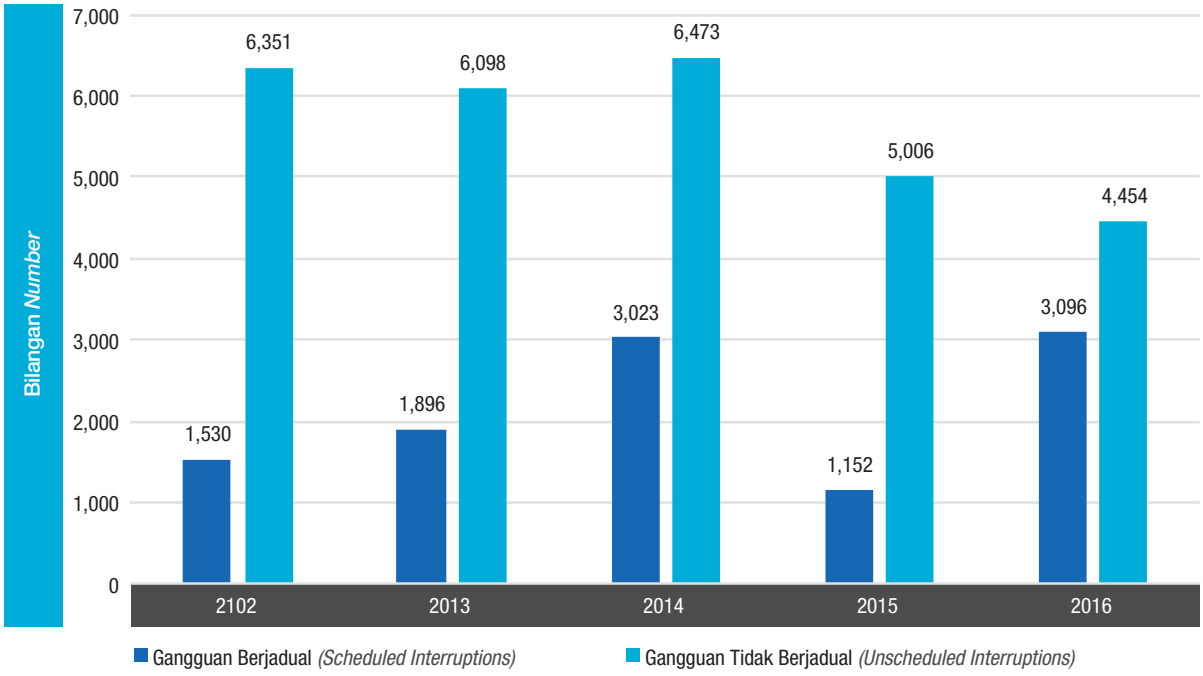
Carta 30: Gangguan bekalan elektrik per 1,000 pengguna SEB
Chart 30: SEB electricity supply interruptions per 1,000 consumers



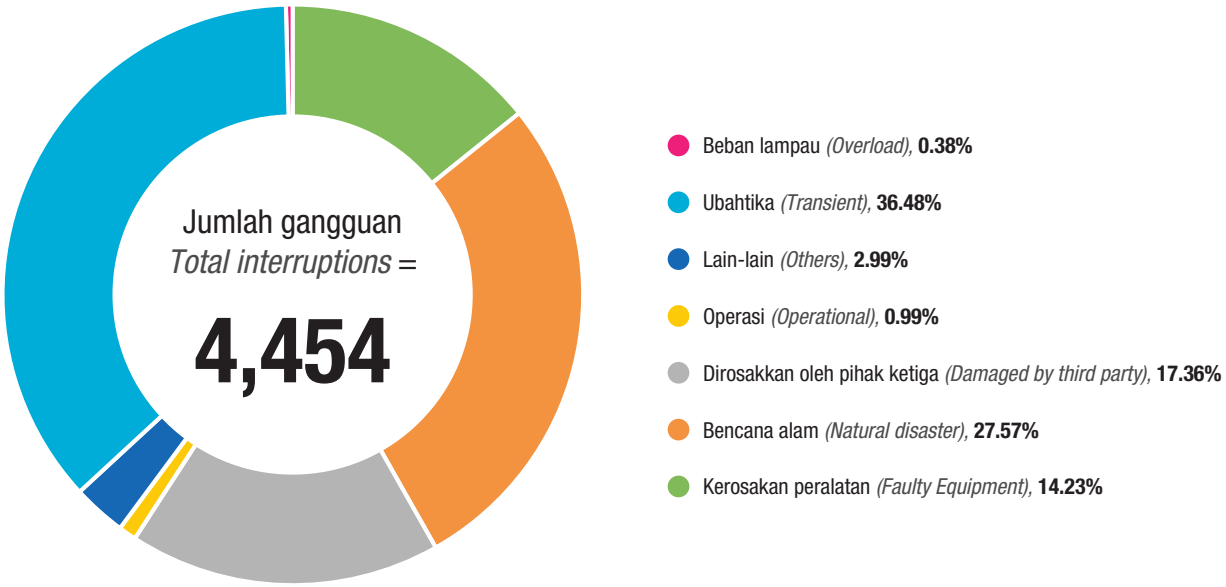
Carta 31: Purata gangguan bekalan elektrik bulanan SEB
Chart 31: SEB monthly average electricity supply interruptions



Carta 32: Bilangan gangguan bekalan elektrik SEB
Chart 32: SEB number of electricity supply interruptions

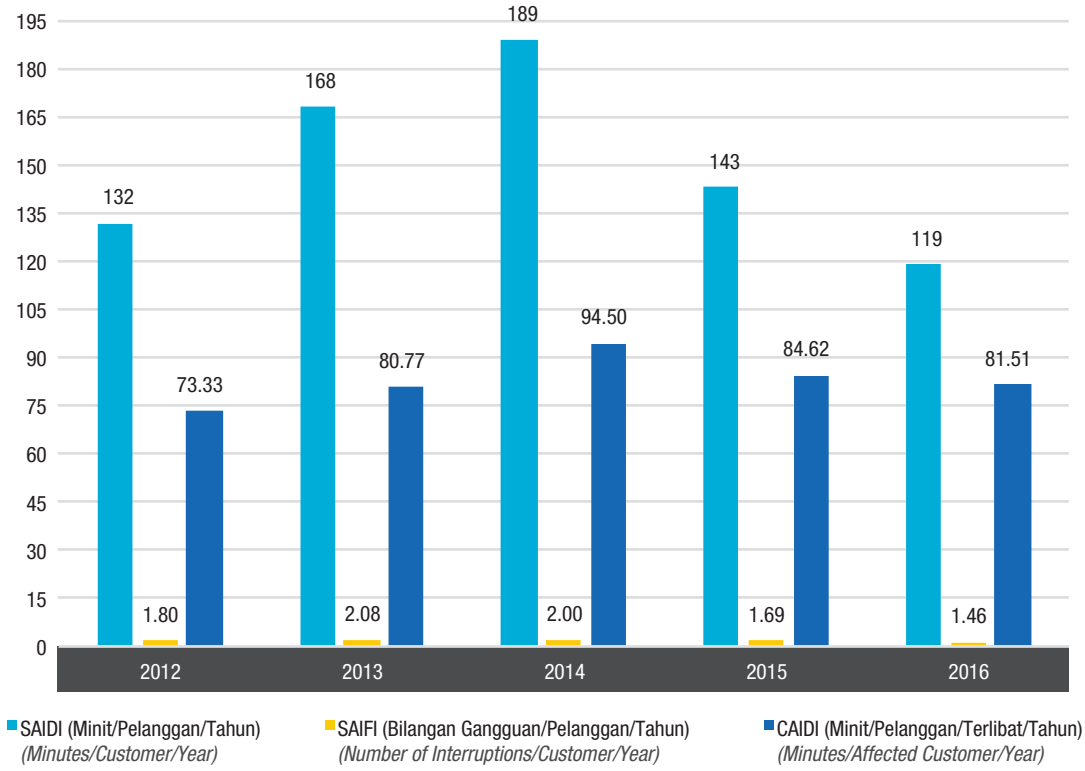


Carta 33: Gangguan bekalan elektrik tidak berjadual SEB mengikut jenis gangguan
Chart 33: SEB number of unscheduled electricity supply interruptions by type of interruptions



Carta 34: *System average interruption duration index* (SAIDI), *system average interruption frequency index* (SAIFI) & *Customer average interruption duration index* (CAIDI) SEB

Chart 34: System average interruption duration index (SAIDI), system average interruption frequency index (SAIFI) & customer average interruption duration index (CAIDI) SEB



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RINGKASAN
SUMMARY

Jadual 61: Kapasiti terpasang setakat 31 Disember 2016
Table 61: Installed capacity as of 31 December 2016

	Kapasiti terpasang (MW) tahun 2016 *Installed capacity (MW) year 2016*										JUMLAH *TOTAL*
	Hidro Major *Major Hydro*	**Gas asli** *Natural gas*	**Arang batu** *Coal*	*MFO/ Distillate/ Diesel*	**Gas asli & minyak** *Natural gas & oil*	**Solar**	**Biojisim** *Biomass*	**Biogas**	**Hidro mini** *Mini hydro*	**Lain-lain** *Others*	
SEMENANJUNG MALAYSIA[1] *PENINSULAR MALAYSIA[1]*											
TNB	2,521.00	4,984.00							9.32		7,514.32
PENJANA BEBAS *IPP*		5,995.50	9,066.00		564.00						15,625.50
TBB *RE*						247.29	53.88	49.32	37.83		388.32
TBB COGEN (PERSENDIRIAN) *(PRIVATE)*		459.82		79.20			12.41			12.00	563.43
COGEN (AWAM) *(PUBLIC)*		437.60								13.00	450.60
PERSENDIRIAN (<5 MW) *SELF GEN (<5 MW)*				399.04		1.00	351.79	4.85	2.13		758.81
JUMLAH KECIL *SUBTOTAL*	**2,521.00**	**11,876.92**	**9,066.00**	**478.24**	**564.00**	**248.29**	**418.08**	**54.17**	**49.28**	**25.00**	**25,300.98**
SABAH[1]											
SESB	75.00	112.00		180.90					8.11		376.01
PENJANA BEBAS *IPP*		1,012.64		101.90							1,114.54
TBB *RE*						24.77	51.00	9.64	6.50		91.91
TBB COGEN (PERSENDIRIAN) *(PRIVATE)*		65.00					87.00				152.00
COGEN (AWAM) *(PUBLIC)*		41.80					29.20				71.00
PERSENDIRIAN (<5 MW) *SELF GEN (<5 MW)*				526.77		0.13	130.35	8.81			666.06
JUMLAH KECIL *SUBTOTAL*	**75.00**	**1,231.44**	**0.00**	**809.57**	**0.00**	**24.90**	**297.55**	**18.45**	**14.61**	**0.00**	**2,471.52**
SARAWAK											
SEB	1,053.80	658.60	480.00	49.80		0.30			1.70		2,244.20
PENJANA BEBAS *IPP*	2,400.00										2,400.00
COGEN[2]		389.00									389.00
PERSENDIRIAN[2] *SELF GEN[2]*				11.60			49.00	0.50		5.10	66.20
JUMLAH KECIL *SUBTOTAL*	**3,453.80**	**1,047.60**	**480.00**	**61.40**	**0.00**	**0.30**	**49.00**	**0.50**	**1.70**	**5.10**	**5,099.40**
JUMLAH *TOTAL*	**6,049.80**	**14,155.96**	**9,546.00**	**1,349.21**	**564.00**	**273.49**	**764.63**	**73.12**	**65.59**	**30.10**	**32,871.90**

Nota • *Notes:*

[1] Bagi RE, cogeneration dan penjanaan persendirian bawah 5 MW di Semenanjung dan Sabah, kapasiti yang dinyatakan ialah kapasiti yang dilesenkan (lesen sah sehingga 31 Disember 2016). Penjanaan dalam GWj pula adalah berdasarkan pelaporan oleh pemegang lesen terbabit. *RE, cogeneration and self- generation below 5 MW in Peninsular and Sabah, the capacity specified is licensed capacity (valid as of 31 December 2016). The generation in GWh is based on the reporting by the licensees.*

[2] Sumber: Kementerian Utiliti Sarawak *Source: Ministry of Utility Sarawak*

Jadual 62: Penjanaan elektrik setakat 31 Disember 2016

Table 62: Electricity generation as of 31 December 2016

	Penjanaan (GWj) tahun 2016 *Generation (GWh) year 2016*										JUMLAH *TOTAL*
	Hidro Major *Major Hydro*	**Gas asli** *Natural gas*	**Arang batu** *Coal*	*MFO/ Distillate/ Diesel*	**Gas asli & minyak** *Natural gas & oil*	**Solar**	**Biojisim** *Biomass*	**Biogas**	**Hidro mini** *Mini hydro*	**Lain-lain** *Others*	
SEMENANJUNG MALAYSIA[1] *PENINSULAR MALAYSIA[1]*											
TNB	3,837.67	20,207.53		0.74					9.31		24,055.25
PENJANA BEBAS *IPP*		35,574.30	63,156.44	77.66	422.80						99,231.20
TBB *RE*						124.67	95.15	94.14	45.71		359.67
TBB COGEN (PERSENDIRIAN) *(PRIVATE)*		1,627.32		n/a			8.46			n/a	1,635.78
COGEN (AWAM) *(PUBLIC)*		2,202.22								10.54	2,212.76
PERSENDIRIAN (<5 MW) *SELF GEN (<5 MW)*				11.06		0.12	102.62	7.14	5.28	2.04	128.26
JUMLAH KECIL ***SUBTOTAL***	**3,837.67**	**59,611.37**	**63,156.44**	**89.46**	**422.80**	**124.79**	**206.23**	**101.28**	**60.30**	**12.58**	**127,622.92**
SABAH[1]											
SESB	255.74	389.62		229.88					5.13		880.37
PENJANA BEBAS *IPP*		4,957.71		218.57							5,176.28
TBB *RE*						7.43	210.62	20.33	4.69		243.06
TBB COGEN (PERSENDIRIAN) *(PRIVATE)*		0.01					18.38				18.39
COGEN (AWAM) *(PUBLIC)*		n/a					36.49				36.49
PERSENDIRIAN (<5 MW) *SELF GEN (<5 MW)*				129.71			191.05	4.72			325.48
JUMLAH KECIL ***SUBTOTAL***	**255.74**	**5,347.34**	**0.00**	**578.16**	**0.00**	**7.43**	**456.54**	**25.05**	**9.82**	**0.00**	**6,680.07**
SARAWAK											
SEB	3,905.33	3,108.95	3,089.61	36.19		0.12			3.42		10,143.62
PENJANA BEBAS *IPP*	12,285.00										12,285.00
COGEN[2]		1,803.37									1,803.37
PERSENDIRIAN[2] *SELF GEN[2]*				15.00			111.87	0.00		9.754	136.62
JUMLAH KECIL ***SUBTOTAL***	**16,190.33**	**4,912.32**	**3,089.61**	**51.19**	**0.00**	**0.12**	**111.87**	**0.00**	**3.42**	**9.75**	**24,368.61**
JUMLAH ***TOTAL***	**20,283.74**	**69,871.03**	**66,246.05**	**718.81**	**422.80**	**132.34**	**774.64**	**126.33**	**73.54**	**22.33**	**158,671.61**

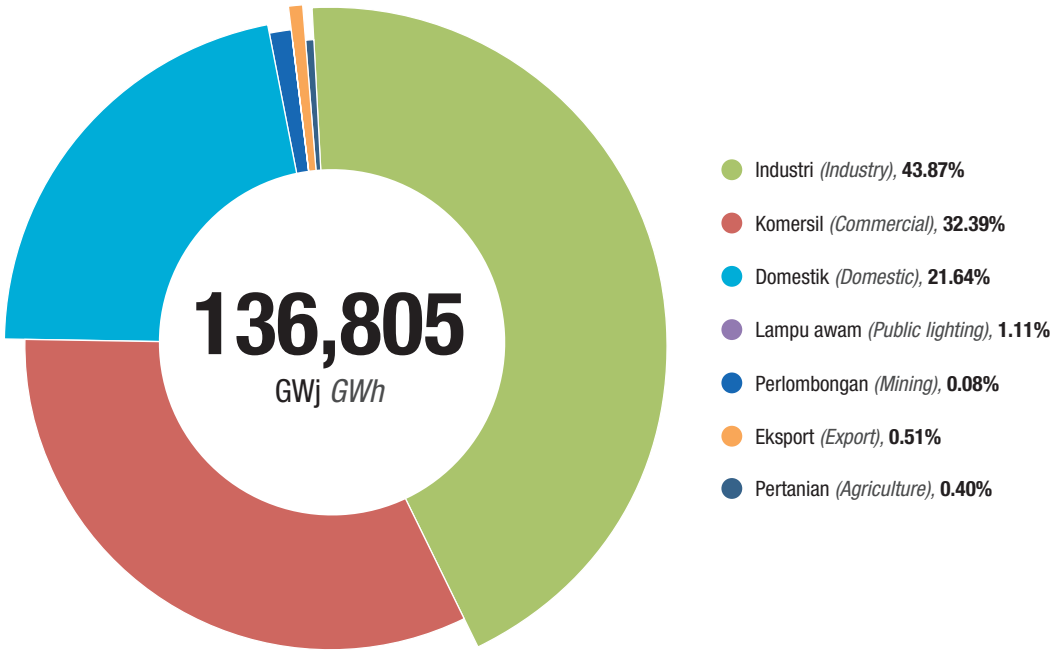
Nota • *Notes:*

[1] Bagi RE, cogeneration dan penjanaan persendirian bawah 5 MW di Semenanjung dan Sabah, kapasiti yang dinyatakan ialah kapasiti yang dilesenkan (lesen sah sehingga 31 Disember 2016). Penjanaan dalam GWj pula adalah berdasarkan pelaporan oleh pemegang lesen terbabit. *RE, cogeneration and self- generation below 5 MW in Peninsular and Sabah, the capacity specified is licensed capacity (valid as of 31 December 2016). The generation in GWh is based on the reporting by the licensees.*

[2] Sumber: Kementerian Utiliti Sarawak *Source: Ministry of Utility Sarawak*

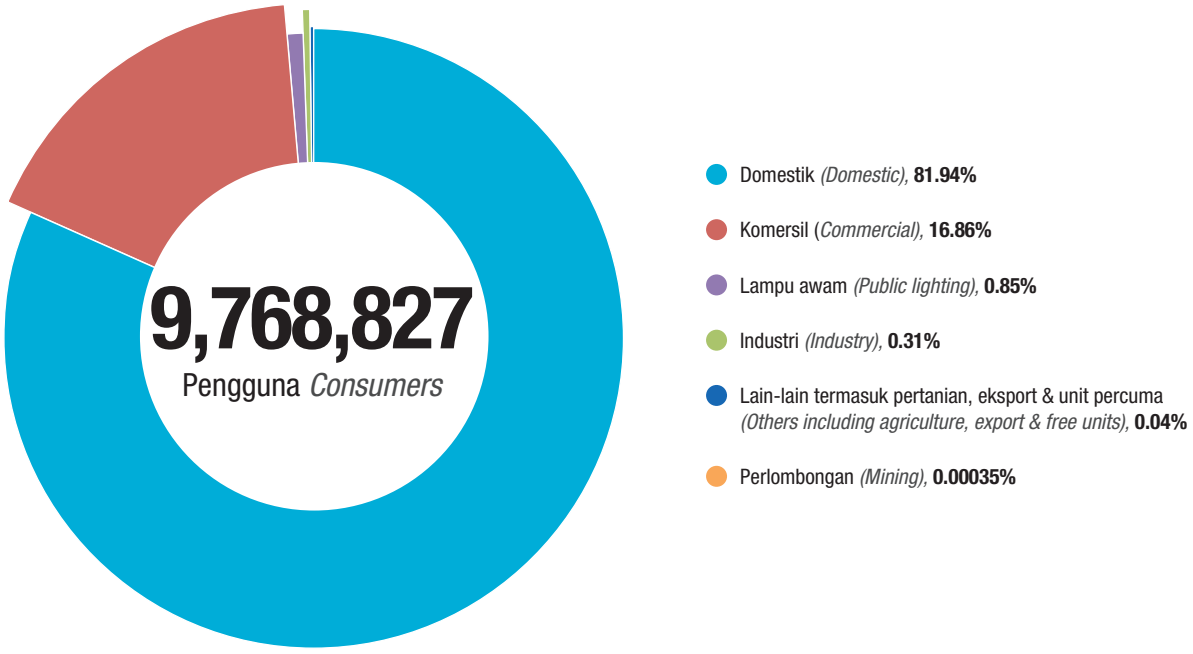
Jadual 63: Jualan tenaga elektrik mengikut sektor tahun 2016
Table 63: Electricity sales by sector in 2016

Syarikat *Company*	Jualan tenaga elektrik mengikut sektor (GWj) *Electricity sales by sector (GWh)*							Jumlah *Total*
	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Perlombongan *Mining*	Pertanian *Agriculture*	Eksport *Export*	
TNB	25,745	39,447	42,977	1,374	113	543	0.74	**110,200**
SESB	1,761	2,352	1,101	70	-	-	-	**5,284**
SEB	2,101	2,514	15,936	77	-	-	693	**21,321**
JUMLAH *TOTAL*	**29,607**	**44,313**	**60,014**	**1,521**	**113**	**543**	**694**	**136,805**



Jadual 64: Bilangan pengguna mengikut sektor tahun 2016
Table 64: Number of consumers by sector in 2016

Syarikat *Company*	Bilangan pengguna mengikut sektor *Number of consumers by sector*						Jumlah *Total*
	Domestik *Domestic*	Komersil *Commercial*	Industri *Industry*	Lampu awam *Public lighting*	Perlombongan *Mining*	Lain-lain termasuk pertanian, eksport & unit percuma *Others including agriculture, export & free units*	
TNB	6,989,968	1,464,815	27,556	67,808	34	4,337	**8,554,518**
SESB	478,049	90,510	1,545	5,906	-	-	**576,010**
SEB	536,466	91,359	1,013	9,457	-	4	**638,299**
JUMLAH *TOTAL*	**8,004,483**	**1,646,684**	**30,114**	**83,171**	**34**	**4,341**	**9,768,827**



APENDIKS
APPENDIX

Apendiks 1: Laporan prestasi Tenaga Nasional Berhad (TNB) – Berdasarkan *Guaranteed Service Level* (GSL)

Appendix 1: Performance report of Tenaga Nasional Berhad (TNB) - Based on Guaranteed Service Level (GSL)

item	Service Dimension	Service Indicator	Target	Penalty	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total
		Number of unplanned interruptions	4 per year (Bandaraya Kuala Lumpur & Putrajaya) & 5 per year (Other areas)	1. Domestic - 1% of avg bill or min RM10;														
		Total interruptions		2. Commercial - 1% of avg bill or max RM300;	10	89	704	568	747	2,146	252	630	284	693	417	1,340	338	**8,218**
		Total incidents (not achieving target)		3. Industrial - 0.5% of avg bill or max RM1,000	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**
		Time taken to restore electricity supply following outage	3 hrs (Minor fault);	1. Domestic - 1% of avg bill or min RM10;														
			4 hrs (Major fault-MV-with feedback);	2. Commercial - 1% of avg bill or max RM300;														
		Total interruptions	12 hrs (Major fault-MV-without feedback);	3. Industrial - 0.5% of avg bill or max RM1,000	10	89	704	568	747	2,146	252	630	284	693	417	1,340	338	**8,218**
		Total incidents (not achieving target)	8 hrs (grid/ transmission-partial blackout)		0	4	8	16	11	101	6	24	1	26	20	88	23	**328**
		Total penalty (RM)	18 hrs (grid/ transmission-total blackout)		0	890,800	225,500	1,347,520	307,670	2,273,680	202,490	871,480	2,160	984,240	194,280	1,900,680	467,960	**9,668,460**
	Percentage Performance (%)				100.00	95.51	98.86	97.18	98.53	95.29	97.62	96.19	99.65	96.25	95.20	93.43	93.20	**96.01**

item	Service Dimension	Service Indicator	Target	Penalty	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total
GSL3		Time taken to implement connection (overhead line) requiring low voltage cable installation work	5 w/days (overhead line)	RM50														
		Total connection (overhead line)			6	3,035	5,907	2,485	4,674	7,062	2,756	4,571	7,704	1,757	2,031	7,156	7,921	**57,065**
		Total connection not completed in 5 working days			0	557	924	55	128	1552	133	327	362	92	202	346	620	**5,298**
		Total penalty (RM)			0	27,850	46,200	2,750	6,400	77,600	6,650	16,350	18,100	4,600	10,100	17,300	31,000	**264,900**
		Time taken to implement connection (underground cable) requiring low voltage cable installation work	14 w/days (underground cable)	RM50														
		Total service connection (underground cable)			89	38	184	69	224	1304	167	151	285	710	296	740	306	**4,563**
		Total service connection not completed in 14 working days			3	4	9	1	39	32	4	5	8	66	10	47	9	**237**
		Total penalty (RM)			150	200	450	50	1,950	1,600	200	250	400	3,300	500	2,350	450	**11,850**
Percentage Performance (%)					96.84	81.74	84.68	97.81	96.59	81.07	95.31	92.97	95.37	93.60	90.89	95.02	92.35	**91.02**

item	Service Dimension	Service Indicator	Target	Penalty	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total
		Time taken to connect new electricity supply for individual domestic low voltage consumer	3 w/days	RM50														
		Total supply connection			2,879	1,505	11,151	9,915	12,204	14,382	6,432	6,909	13,922	10,755	6,192	17,513	6,010	**119,769**
		Total supply connection not completed in 3 working days			307	15	226	256	385	926	328	382	1014	464	253	706	270	**5,532**
		Total penalty (RM)			15,350	750	11,300	12,800	19,250	46,300	16,400	19,100	50,700	23,200	12,650	35,300	13,500	**276,600**
Percentage Performance (%)					89.34	99.00	97.97	97.42	96.85	93.56	94.90	94.47	92.72	95.69	95.91	95.97	95.51	**95.38**
GSL 5	*Customer Contact*	Disconnection of supply according to the applicable legislation or disconnection procedures	No wrongful disconnection	RM100														
		Total disconnection			5,572	7,636	65,370	34,431	75,554	54,725	21,866	25,909	23,105	53,879	27,928	22,758	32,349	**451,082**
		Total disconnection not done with procedures			0	0	0	1	0	0	0	0	0	2	1	2	0	**6**
		Total penalty (RM)			100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	**100.00**
Percentage Performance (%)					100.00	95.51	98.86	97.18	98.53	95.29	97.62	96.19	99.65	96.25	95.20	93.43	93.20	**96.01**
Total Penalty in RM according to states (GSL1, 2, 3, 4, 5)					15,500	919,600	283,450	1,363,220	335,270	2,399,180	225,740	907,180	71,360	1,015,540	217,630	1,955,830	512,910	**10,222,410**
Total Penalty in RM - Nationwide (GSL1, 2, 3, 4, 5)					**10,222,410**													
Overal Percentage Performance (%)					**96.48%**													

Apendiks 2: Laporan prestasi Tenaga Nasional Berhad (TNB) – Berdasarkan Minimum Service Level (MSL)

Appendix 2: Performance report of Tenaga Nasional Berhad (TNB) - Based on Minimum Service Level (MSL)

item	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/Avg %
1	Availability of Supply															
	1A. Minimum duration of notice for planned/schedule interruption of electricity supply	> 2 days														
	Total notices served		423	14	793	1,318	1443	4,715	671	1,386	315	1,070	989	2293	348	**15,778**
	Total notices served more than 2 days before planned/schedule interruption		423	14	752	1243	1406	4616	661	1,359	313	1021	939	2,237	325	**15,309**
	% Compliance		100.00	100.00	94.83	94.31	97.44	97.90	98.51	98.05	99.37	95.42	94.94	97.56	93.39	**97.03**
	1b. Upon request, time taken to provide initial information to consumer who report on electricity interruption	< 1 hour														
	Total requests from consumers								548							**548**
	Total requests replied less than 1 hour								543							**543**
	% Compliance								99.09							**99.09**
2	Quality of Supply															
	2a. Time taken to rectify voltage complaint or limit violation and correct voltage complaint which requires network reinforcement	< 180 days														
	Total complaints received		0	0	0	1	0	4	0	0	0	1	0	2	0	**8**
	Total complaints solved less than 180 days		0	0	0	1	0	4	0	0	0	1	0	2	0	**8**
	% Compliance		None	None	None	100.00	None	100.00	None	None	None	100.00	None	100.00	None	**100.00**
	2b. Time taken to complete investigation of over voltage and under voltage complaints from complaint received date	< 30 working days														
	Total complaints received		0	6	0	61	0	0	0	0	0	101	73	0	30	**271**
	Total complaints solved less than 30 working days		0	6	0	56	0	0	0	0	0	101	29	0	30	**222**
	% Compliance		None	100.00	None	91.80	None	None	None	None	None	100.00	39.73	None	100.00	**81.92**

item	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/Avg %
	2c. Time taken to provide a complete report of voltage saq from complaints received date	< 14 days														
	Total complaints received		7	0	3	165	18	94	10	13	0	69	36	23	0	**438**
	Total complaints solved less than 14 days		7	0	2	165	12	74	6	13	0	67	33	19	0	**398**
	% Compliance		100.00	None	66.67	100.00	66.67	78.72	60.00	100.00	None	97.10	91.67	82.61	None	**90.87**
3	Providing Supply	i) For supply up to 22kV :< 30 days ii) For supply of 33kV : < 60 days														
	3a. Time taken to inform the developer of the connection charges to be paid upon receipt of complete application															
	Total no. of contribution charge letters issued		34	5	73	112	151	483	74	106	64	169	118	442	27	**1,858**
	Total no. of contribution charge letters issued less than 60 days		34	5	50	105	137	439	65	95	59	161	114	423	26	**1,713**
	% Compliance		100.00	100.00	68.49	93.75	90.73	90.89	87.84	89.62	92.19	95.27	96.61	95.70	96.30	**92.20**
	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														
	Total no. of projects given supply		20	9	59	136	65	377	46	73	8	135	126	354	14	**1,422**
	Total no. of projects given supply less than 120 days		12	8	47	132	62	346	43	69	7	132	67	328	11	**1,264**
	% Compliance		60.00	88.89	79.66	97.06	95.38	91.78	93.48	94.52	87.50	97.78	53.17	92.66	78.57	**88.89**
	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		3,094	1,781	13,792	15,228	19,710	47,058	7,674	12,440	9,902	22,564	11,507	33,129	9,944	**207,823**
	Total appointments met in not less than 1 hour of appointement date		3,094	1,781	13,792	15,228	19,710	47,058	7,674	12,440	9,902	22,564	11,507	33,129	9,944	**207,823**
	% Compliance		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	**100.00**

item	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/Avg %
4	Customer Contact															
	4a. Time taken to reply to written enquiry or complaint	< 7 working days														
	Total written enquiries/complaints received		0	0	2	7	9	20	2	2	2	25	5	15	16	**105**
	Total written enquiries/complaints replied less than 7 working days		0	0	2	7	9	18	2	2	2	25	5	15	16	**103**
	% Compliance		None	None	100.00	100.00	100.00%	90.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	**98.10%**
	4b. Average queuing time at customer service counter															
	Total customers served		10,173	52,334	768,812	178,447	851,749	423,865	342,884	654,889	363,282	284,938	298,598	636,094	700,550	**5,566,615**
	Total customers served less than 15 minutes		9,402	48,903	707,786	170,200	777,106	368,331	308,681	609,566	319,868	255,215	292,760	570,718	645,087	**5,083,623**
	% Compliance		92.42	93.44	92.06	95.38	91.24	86.90	90.02	93.08	88.05	89.57	98.04	89.72	92.08	**91.32**
	4c. Average time taken by customer service officer at CMC 15454 to pick up ringing telephone	90% calls answered within 30 seconds														
	Total incoming calls received		2,358,537													**2,358,537**
	Total incoming calls answered less than 30 seconds		2,248,161													**2,248,161**
	% Compliance		95.32													**95.32**
5	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		0	122	110	66	1,106	350	161	25	2	97	404	758	139	**3,340**
	No. of appointments, visit, testing completed less than 2 working days		0	122	103	57	947	256	151	18	0	27	392	691	102	**2,866**
	% Compliance		None	100.00	93.64	86.36	85.62	73.14	93.79	72.00	0.00	27.84	97.03	91.16	73.38	**85.81**

item	Service Indicator	Service Standard	Putrajaya/ Cyberjaya	Perlis	Kedah	P.Pinang	Perak	Selangor	Melaka	Pahang	Terengganu	Kuala Lumpur	Negeri Sembilan	Johor	Kelantan	Total/Avg %
	5b. Time taken to respond to metering problem or dispute upon official notification/request by the consumer (replace, relocate, etc)	< 3 working days														
	No. of meter replacement/relocation completed		0	0	36	41	840	172	38	15	0	17	242	522	77	**2,000**
	No. of meter replacement/relocation completed less than 3 working days		0	0	36	40	834	150	37	15	0	16	242	493	72	**1,935**
	% Compliance		None	None	100.00	97.56	99.29	87.21	97.37	100.00	None	94.12	100.00	94.44	93.51	**96.75**
	5c. Time interval between successive rendering of bill(s)	1 month														
	Total no. of customers (OPC)		510,011	491,434	7,391,259	7,382,340	10,168,720	20,543,684	3,758,125	5,657,334	3,919,176	13,182,554	4,969,003	14,549,330	5,170,258	**97,693,228**
	Total no. of billed customers		508,860	491,430	7,379,356	7,366,910	10,157,186	20,468,428	3,753,566	5,651,862	3,913,226	13,156,795	4,959,383	14,518,737	5,164,937	**97,490,676**
	% Compliance		99.77%	100.00%	99.84%	99.79%	99.89%	99.63%	99.88%	99.90%	99.85%	99.80%	99.81%	99.79%	99.90%	**99.79%**
	Average % Compliance		93.49	88.76	92.52%	96.28%	89.64%	95.46%	92.23%	90.51%	91.78%	93.97%	84.74%	91.24%	88.58%	**94.16%**
	Average % Compliance		**97.48%**													

Apendiks 3: Laporan prestasi NUR Distribution Sdn. Bhd. (NUR)

Appendix 3: Performance report of NUR Distribution Sdn. Bhd. (NUR)

Indicator	2016
1. Connection of Supply - After submitted complete ESA	
A. Change of Tenancy	
Number of Application	63
Number of connection not more than 1 working day.	63
Percentage of connection not more than 1 working day.	100%
B. New Connection (Low Voltage Individual)	
i. Low Voltage Individual Application	
Number of Application	233
Number of connection not more than 1 working day.	233
Percentage of connection not more than 1 working day.	100%
ii. Low Voltage Bulk application and housing schemes.	
Number of Application	7
Number of connection not more than 1 week. (meter only)	7
Percentage of connection not more than 1 week.	100%
2. Restoration of supply after interruption	
i. Complaint	
Number of complaint receive.	0
Number of consumers given complaint number after reporting.	0
Percentage of consumers given complaint number after reporting.	NA
ii. Minor fault	
Number of minor fault.	18
Number of minor fault restore within 90 minutes	10
Percentage of minor fault restore within 90 minutes	56%
iii. Major fault	
Number of major fault.	34
Number of major fault restore within 12 hours	33
Percentage of major fault restore within 12 hours	97%
3. Supply re-connection after disconnection for non-payment	
Number of disconnection.	30
Number of consumers make payment before 2 pm at the same day	30
Percentage of reconnection at the same day of disconnection.	100%
4. Scheduled / planned supply interruptions.	
Number of scheduled / planned interruptions for Domestic or small	35
Number of consumer given notice 7 days before the scheduled / planned	34
Percentage of consumer given notice 7 days before the scheduled /	97%
5. Meter reading	
Number of domestic consumers given estimated reading.	0
Number of domestic consumers given estimated reading more than 2	0
Percentage of domestic consumers given estimated reading more than 2	NA
6. Enquiries from consumers	
Number of enquires received.	123
Number of enquires respond within :	123
Percentage of enquires respond within :	100%
7. Service Counter	
Number of consumer at service counter	0
Number of consumer waiting at service counter not exceed 10 minutes.	0
Percentage of consumer waiting at service counter not exceed 10	NA

Indicator	2016
8. Appointment for meter accuracy determination	
Number of appointment for meter accuracy determination.	22
Number of appointment for meter accuracy determination not more than 2	22
Percentage of connection not more than 1 working day.	100%
9. Meter replacement	
Number of request for meter replacement.	24
Number of replacement done within 2 working days after request.	24
Percentage of replacement done within 2 working days after request.	100%
10. Appointment with consumers	
Number of appointments.	361
Number of appointment arrive on time	361
Percentage of appointment arrive on time	100%
11. Security Deposits	
Number of customer where their security deposit after 6 month is more	361
12. Refund of consumer deposits	
Number of consumer submit complete documents for refunf of deposit	134
Percentage of consumer get refund of deposit within 1 month.	100.00%
13. Collection	
Percentage of consumer have been given receipt of payment for those	NA
14. Disconnection of supply	
i. Without Notice	
Number of disconnection due to installation which were very dangerous.	NA
Number of disconnection due tounsafe particular situation and likely source of danger to consumers.	NA
ii. With Notice	
Number of disconnection due to other reason stated in 14 (i) after notice	38
16. Voltage outside standard	
i. No capital work on network is required	
Number of complaints	NA
Number of complaints resolved in 1 day.	NA
ii. Network enhancement work is required	
Number of complaints	NA
Number of complaints resolved in 6 months.	NA
17. New / Increase of supply application reply	
i. No substation required	
Number of application	8
Percentage of written reply given for application of supply within 1 week.	100%
ii. Substation required	
Number of application	8
Percentage of written reply given for application of supply within 1 week.	100%
18. Transferring of meter location upon consumer request / Meter	
Number of request for meter relocation from customer which is needed	21
Percentage of request resove within 3 working days.	100%
19. Education of Energy Efficiency	
Number of education inf energy efficiency program.	4
20. Power Quality improvement	
Power Quality meeting with all major customers on Quarterly basis.	48

Sumber • *Source:* NUR Distribution Sdn. Bhd

Nota • *Notes:*
1. N/A Tidak Diperolehi *Not Available*
2. Data Tahun Kalendar *Calendar Year Data*

Apendiks 4: Laporan prestasi Sabah Electricity Sdn. Bhd. (SESB)
Appendix 4: Performance report of Sabah Electricity Sdn. Bhd. (SESB)

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
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
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%
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
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
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%
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
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
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%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
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
2.3	Bilangan pengguna yang diberi nombor aduan	*Number of consumer who given a complaint reference number*	305,794	334,008	318,960
2.4	Bilangan kerosakan kecil	*Number of minor outage*	28,116	33,152	39,175
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
2.6	Bilangan kerosakan besar	*Number of major outage*	5,245	5,063	4,127
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
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%
2.9	Peratus bilangan pengguna yang diberi nombor aduan	*Percentage of consumer who given a complaint reference number*	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%
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%
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
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

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
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%
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
4.1.2	Bilangan pengguna terlibat	*Number of consumer affected*	263,709	203,035	268,554
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
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%
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
4.2.2	Bilangan pengguna besar yang dijangka terlibat	*Number of large power consumer affected*	28,337	4,314	64,305
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
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%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
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
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%
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
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
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%
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
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
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%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
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
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
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%
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
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
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%
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
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
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%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
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
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%
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
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
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%
10.4	Bilangan temujanji yang perlu ditangguhkan	*Number of appointment has to be postponed*	60	127	182
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
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%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
11.2	Bilangan pengguna yang mana dipulangkan lebihan cagarannya	*Number of consumer who refunded the excess deposit*	625	5,590	1,869
11.3	Peratus bilangan pengguna yang mana dipulangkan lebihan cagarannya	*Percentage of consumer who refunded the excess deposit*	92.87%	88.53%	100.00%
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
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
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%
13	**PUNGUTAN**	***COLLECTION***			
13.1	Bilangan pengguna yang membayar melalui pos	*Number of consumer paid via mail*	161,058	132,729	49,678
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
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%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
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
14.1.2	Bilangan pemotongan akibat disyaki berlaku kecurian elektrik	*Number of disconnection due to suspected theft of electrical*	146	376	218
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 working days of notice*	81,647	94,772	106,957
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
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
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
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
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
15.4	Bilangan pengguna lanjut usia yang dibantu dalam urusan pembayaran bil	*Number of elderly consumer who assisted in the payment of bills*	48	176	254

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
16	**MASALAH VOLTAN DI LUAR TAHAP DIISYTIHARKAN**	***VOLTAGE PROBLEM DUE TO OVER/UNDER VOLTAGE***			
16.1	TIDAK MEMERLUKAN PENGUKUHAN SISTEM	*NOT REQUIRE SYSTEM IMPROVEMENT*			
16.1.1	Bilangan aduan	*Number of complaint*	3,307	0	175
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*	3,268	0	175
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%
16.2	MEMERLUKAN PENGUKUHAN SISTEM	*REQUIRE SYSTEM IMPROVEMENT*			
16.2.1	Bilangan aduan	*Number of complaint*	104	117	183
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
16.2.3	Peratus bilangan aduan yang diselesaikan dalam tempoh 3 bulan dari tarikh aduan dibuat	*Percentage of complaint resolved within 3 months from the date of complaint received*	94.74%	100.00%	99.45
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 dikemukakan kepada 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
17.1.2	Bilangan permohonan yang dijawab dalam masa 1 minggu dari tarikh permohonan dibuat	*Number of application replied within 1 weeks from the date of application*	3,268	3,265	1,130
17.1.3	Peratus bilangan permohonan yang dijawab dalam masa 1 minggu dari tarikh permohonan dibuat	*Percentage of application replied within 1 weeks from the date of application*	98.82%	99.76%	99.47%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
17.2	MEMERLUKAN PENCAWANG BARU	*REQUIRE NEW SUBSTATION*			
17.2.1	Bilangan permohonan	*Number of application*	104	110	82
17.2.2	Bilangan permohonan yang dijawab dalam masa 1 minggu dari tarikh permohonan dibuat	*Number of application replied within 2 weeks from the date of application*	104	110	82
17.2.3	Peratus bilangan permohonan yang dijawab dalam masa 1 minggu dari tarikh permohonan dibuat	*Percentage of application replied within 2 weeks from the date of application*	100.00%	100.00%	100%
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
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
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*	73	52	23
18.4	Peratus bilangan permohonan yang perlu dan dirasakan sesuai yang diselesaikan dalam tempoh 3 hari bekerja	*Percentage of necessary and appropriate application that completed within 3 working days*	97.33%	100.00%	88.46%

			TK 2013/2014 FY 2013/2014	TK 2014/2015 FY 2014/2015	TK 2015/2016 FY 2015/2016
19	**PENDIDIKAN PENGGUNA MENGENAI CARA PENGGUNAAN ELEKTRIK DENGAN CEKAP DAN SELAMAT**	***CONSUMER EDUCATION PROGRAMME***			
16.1.1	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 electricity effectively and securely and how to avoid electricity accident including activities nearby installations and power lines that had been conducted*	19	14	14
20	**PENINGKATAN KUALITI BEKALAN**	***QUALITY SUPPLY 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

Sumber • *Source:* SESB

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*		
	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

Bil. *No.*	Kategori Tarif *Tariff Category*	Unit	Kadar *Rate*
	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
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

Bil. *No.*	Kategori Tarif *Tariff Category*	Unit	Kadar *Rate*
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	
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	

Bil. *No.*	Kategori Tarif *Tariff Category*	Unit	Kadar *Rate*	Standby
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
	Bagi semua kWj *For all kWh*	sen/kWj *sen/kWh*	26.80
	Caj minimum bulanan *Minimum monthly charge*	RM	1,000.00

Bil. *No.*	**Kategori Tarif** *Tariff Category*	**Unit**	**Kadar semasa** *current rate*
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 F*or 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)*				
	2012	**2013**	**2014**	**2015**	**2016**
TNB					
Domestik *Domestic*	28.93	29.15	32.28	32.67	33.21
Komersil *Commercial*	40.98	40.76	47.10	47.68	46.76
Industri *Industrial*	30.89	31.00	35.88	36.56	37.13
Perlombongan *Mining*	20.81	20.55	23.99	25.00	25.34
Lampu awam *Public lighting*	21.53	21.55	25.06	25.49	25.57
Pertanian *Agriculture*	39.64	39.35	45.29	45.86	45.78
Purata *Average*	**33.83**	**33.87**	**38.86**	**39.45**	**39.55**
SESB					
Domestik *Domestic*	25.10	25.30	29.32	29.14	28.86
Komersil *Commercial*	31.41	33.59	39.25	37.63	38.21
Industri *Industrial*	24.68	28.81	32.90	30.80	31.36
Lampu awam *Public lighting*	18.66	18.75	23.31	22.54	23.09
Purata *Average*	**27.64**	**29.60**	**34.31**	**33.13**	**33.41**
SEB					
Domestik *Domestic*	31.20	31.30	31.30	28.25	28.30
Komersil *Commercial*	32.00	32.00	32.00	31.72	30.53
Industri *Industrial*	24.90	25.10	25.10	24.48	24.15
Lampu awam *Public lighting*	47.00	47.10	47.10	n/a	47.12
Purata *Average*	**29.70**	**29.90**	**29.80**	**28.50**	**28.20**

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

KOS PENJANAAN (sen/kWj) *GENERATION COST (sen/kWh)*	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
(a) Penjanaan sendiri *Own Generation*	20.28	20.13	18.6	18.03	20.65
(b) Elektrik dibeli *Purchased Electricity*	25.05	22.8	20.93	20.21	20.01
(c) Kos keseluruhan (a) & (b) *Overall cost (a) & (b)*	**23.95**	**23.03**	**23.94**	**22.03**	**20.15**

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 cost of SESB

KOS PENJANAAN (sen/kWj) *GENERATION COST (sen/kWh)*	2012	2013	2014	2015	2016
(a) Penjanaan sendiri *Own Generation*	16.16	17.84	25.34	28.29	24.80
(b) Elektrik dibeli *Purchased Electricity*	17.90	20.04	22.75	20.64	19.17
(c) Kos keseluruhan (a) & (b) *Overall cost (a) & (b)*	**17.40**	**19.38**	**20.47**	**48.93**	**44.50**

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

KOS PENJANAAN (sen/kWj) *GENERATION COST (sen/kWh)*	2012	2013	2014	2015	2016
(a) Penjanaan sendiri *Own Generation*	25.89	11.58	15.62[1]	13.10[1]	5.99[1]
(b) Elektrik dibeli *Purchased Electricity*	11.72	10.75	9.96[2]	11.80[2]	10.47[2]
(c) Kos keseluruhan (a) & (b) *Overall cost (a) & (b)*	**14.15**	**10.85**	**10.57[3]**	**11.90[3]**	**8.42[3]**

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 (2012-2016) setakat Disember 2016

Appendix 13: Statistics of rural electrification project coverage (2012-2016) as of December 2016

Kawasan *Region*	Bilangan rumah disambung 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*	**2010**		**2011**		**2012**		**2013**		**2014**		**2015**		**2016**	
Sem. Malaysia *Peninsular Malaysia*	549	759	581	6,713	3,037	3,366	1,336	1,385	1,644	1,540	1,235	1,243	375	375
Sabah	12,236	14,194	4,509	8,248	15,455	15,563	7,735	7,740	4,151	4,227	3,584	3,605	5000	5,000
Sarawak	12,527	12,313	21,792	12,043	20,950	22,101	10,740	10,745	8,500	8,532	8,500	9,582	4500	4,546
Jumlah *Total*	**25,312**	**27,266**	**26,882**	**27,004**	**39,442**	**41,030**	**19,811**	**19,870**	**14,295**	**14,299**	**13,319**	**14,430**	**9,875**	**9,921**

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

Nota
Notes

SURUHANJAYA TENAGA (ENERGY COMMISSION)
No. 12, Jalan Tun Hussein, Precinct 2,
62100 Putrajaya, Malaysia.

T : (03)8870 8500
F : (03)8888 8637
W : www.st.gov.my

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