Suruhanjaya Tenaga
Energy Commission

2019

LAPORAN TAHUNAN
ANNUAL REPORT

LAPORAN TAHUNAN SURUHANJAYA TENAGA 2019 ini dikemukakan kepada Menteri Tenaga, Sains, Teknologi, Alam Sekitar & Perubahan Iklim selaras dengan peruntukan seksyen 33(3) Akta Suruhanjaya Tenaga 2001 iaitu "Suruhanjaya Tenaga hendaklah mengemukakan satu salinan penyata akaun yang diperakui oleh juruaudit dan satu salinan laporan juruaudit kepada Menteri Tenaga, Sains, Teknologi, Alam Sekitar & Perubahan Iklim untuk dibentangkan di Parlimen berserta dengan laporan aktiviti Suruhanjaya Tenaga bagi tahun kewangan sebelumnya".

The ENERGY COMMISSION ANNUAL REPORT 2019 is submitted to the Ministry of Energy, Science, Technology, Environment and Climate Change in accordance with section 33(3) of the Energy Commission Act 2001 which stipulates that "the Energy Commission must present a copy of the audited account statement and a copy of the auditor's report to the Ministry of Energy, Science, Technology, Environment and Climate Change to be tabled in Parliament along with a copy of the Energy Commission's activity report for the previous financial year".

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RASIONAL MUKA DEPAN
COVER RATIONALE

Di Suruhanjaya Tenaga, komitmen kami terhadap inisiatif Kemampanan tertumpu kepada tiga faktor tenaga yang utama atau lebih dikenali sebagai "Trilema Tenaga", iaitu keutamaan yang diberi ke Keberterusan Tenaga demi pembangunan sosio-ekonomi, kepada Alam Sekitar melalui pengurangan pelepasan karbon, dan juga ke arah Digitalisasi bagi membentuk industri pembekalan elektrik dan gas berpaip yang lebih cemerlang dan kompetitif.

Pada 2019, kami telah mencapai kejayaan yang signifikan dalam bidang-bidang tersebut, terutamanya, dalam memacu perkembangan projek-projek tenaga hijau seperti yang dilambangkan pada motif panel solar di sayap rama-rama yang tertera. Pada masa yang sama, kami juga terus memberi tumpuan kepada kepelbagaian kapasiti campuran, seperti yang dilambangkan pada motif tanah di sayap rama-rama, yang mencerminkan bahan api fosil. Kami juga kini berada di ambang liberalisasi pasaran tenaga, di mana penggunaan teknologi-teknologi baharu adalah penting untuk membolehkan kami terus maju ke hadapan.

At the Energy Commission, our commitment to Sustainability is centred around the Energy Trilemma, with priority given to Energy Security for socio-economic development; to the Environment to reduce carbon emissions; and to Digitalisation to build a more vibrant and competitive electricity and piped gas supply industry.

In 2019, we made significant progress in these areas, particularly in the acceleration of green energy projects, as represented by the solar panel motif on the butterfly's wing. At the same time, we continue with the diversity of our capacity mix, as shown in the earth motif on the butterfly's wing to represent fossil fuels. Market liberalisation is already upon us, spurring us to adopt new technologies to move ahead.

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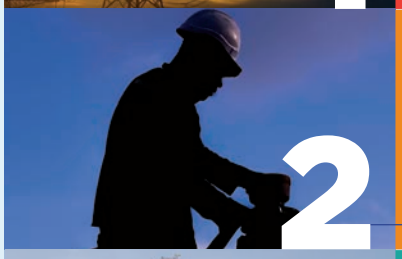

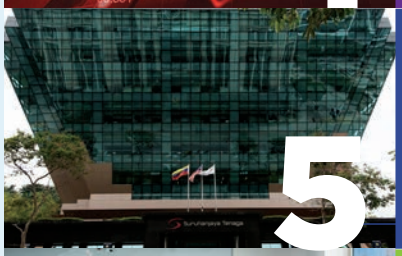

Pada 2019, kita telah menyaksikan ekonomi global meleset kepada 2.9% (2018: 3.6%), dan permintaan tenaga menurun kepada kurang daripada separuh kadar pertumbuhan pada 2018. Agensi Tenaga Antarabangsa juga melaporkan bahawa kadar pertumbuhan permintaan elektrik adalah yang terendah sejak krisis kewangan pada 2008.

In 2019, we saw the global economy slowing down to 2.9% (2018: 3.6%), and energy demand decelerating to less than half the rate of growth in 2018. The International Energy Agency also reported that electricity demand growth rate was the slowest since the 2008 financial crisis.

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Di ketika keadaan global yang muram ini, pertumbuhan ekonomi Malaysia turut meleset ke 4.3% pada 2019 (2018: 4.7%). Bagaimanapun, permintaan maksimum elektrik terus meningkat sebanyak 1.2% kepada 18,566MW di Semenanjung manakala permintaan di Sabah juga turut meningkat sebanyak 4.8% kepada 1,001MW. Permintaan yang terus meningkat di Semenanjung dan Sabah adalah terutamanya disebabkan oleh keadaan cuaca panas ketika fenomena El Nino yang telah melanda negara pada tahun itu.

Usaha berterusan Suruhanjaya Tenaga (ST) untuk meningkatkan keberterusan, kemampuan dan kemampanan tenaga telah membawa kepada pelaksanaan pelbagai inisiatif yang sejajar dengan matlamat negara ke arah dekarbonisasi dan liberalisasi pasaran tenaga.

Pada tahun ini, sistem grid telah menerima kapasiti baharu dengan permulaan operasi 12 projek Solar Berskala Besar (LSS), Pengerang Power di Johor (200MW) dan satu loji janakuasa baharu iaitu Jimah East Power di Negeri Sembilan (2,000MW) untuk memenuhi peningkatan permintaan dan menggantikan kapasiti yang tamat operasi. Margin rizab berada pada tahap selesa 38% pada akhir 2019.

Amid the subdued global scenario, Malaysian economic growth also slowed to 4.3% in 2019 (2018: 4.7%). However, peak electricity demand increased by 1.2% at 18,566MW in the Peninsular while in Sabah, demand grew by 4.8%, reaching 1,001MW. The spike in demand in the Peninsular and Sabah was mainly attributed to hot weather conditions when the El Nino phenomenon swept the nation that year.

The Commission's continuing efforts to enhance energy security, affordability and sustainability have led to the implementation of a variety of initiatives that are also aligned to our national decarbonisation and energy market liberalisation goals.

During the year, new capacity was added into the grid system with the commissioning of 12 Large Scale Solar (LSS) farms, Pengerang Power in Johor (200MW) and a new power plant, Jimah East Power in Negeri Sembilan (2,000MW) to meet increasing demand and replace retiring capacity. Reserve margin stood at a healthy 38% as at end 2019.

PERUTUSAN NGERUSI

CHAIRMAN'S MESSAGE

Perkembangan yang sewajarnya mendapat perhatian di sini adalah kapasiti Tenaga Boleh Baharu (TBB) yang telah meningkat sebanyak empat kali ganda, daripada 179MW pada 2018 kepada 725MW pada 2019. Pencapaian ini adalah sejajar dengan matlamat negara untuk mencapai 20% TBB dalam campuran kapasiti menjelang tahun 2025 ke arah pencapaian matlamat ekonomi rendah karbon.

Tahun ini ST juga telah menganugerahkan sejumlah 491MW kapasiti tenaga solar tambahan melalui pembidaan pusingan ketiga program LSS. Keseluruhannya, ketiga-tiga pusingan pembidaan kompetitif tersebut telah menganugerahkan 1,449MW kapasiti tenaga solar kepada 63 buah syarikat untuk membangunkan loji-loji LSS. Pada akhir 2019, sebanyak 21 stesen penjanaan LSS telah memulakan operasi komersial.

Semakan semula dasar harga bagi tenaga solar yang dijana oleh *prosumer* melalui skim Pemeteran Tenaga Bersih (NEM) yang berkuatkuasa pada 1 Januari telah memesatkan lagi pembangunan tenaga solar di negara ini. Di bawah skim yang disemak semula ini, *prosumer* dibenarkan untuk menjual lebihan elektrik solar PV kepada grid pada kadar tarif runcit elektrik TNB dan tidak berdasarkan kos penggantian bekalan dengan kadar tarif yang lebih rendah. Hasilnya, 125 lesen telah dikeluarkan pada 2019 berbanding 37 lesen pada 2018.

Bagi memudahkan penggunaan TBB, skim tarif premium bagi pengguna yang ingin membeli tenaga hijau telah diperkenalkan. Skim ini memberi pelanggan pilihan untuk membeli tenaga hijau daripada sumber TBB dengan premium 8 sen/kWj tanpa perlu memiliki sistem penjanaan TBB.

Kapasiti TBB akan turut dipertingkatkan lagi berikutan kelulusan Kementerian terhadap Pelan Penjanaan 10 Tahun Semenanjung Malaysia dan Sabah bagi tempoh 2020 ke 2030. Kedua-dua pelan tersebut memberi penekanan kepada penambahan TBB di dalam campuran kapasiti. Tumpuan diberikan kepada tenaga solar di Semenanjung Malaysia dan hidro di Sabah. Penjanaan berasaskan bahan api fosil dijangka menurun dari 82% pada 2020 kepada 70% pada 2030.

What is noteworthy here is the four-fold growth of Renewable Energy (RE) capacity, from 179MW in 2018 to 725MW in 2019. This is in line with our national goal to make RE 20% of the capacity mix by 2025 as we move forward towards becoming a low carbon economy.

The year also saw the Commission awarding a total of 491MW additional solar energy capacity under the LSS Programme's third competitive bidding cycle. Altogether, the three bidding cycles have awarded 1,449MW solar energy capacity to 63 companies to develop LSS farms. As at end 2019, a total of 21 LSS plants have started commercial operations.

Solar energy development was further boosted by pricing policy revision of solar energy produced by prosumers through the Net Energy Metering (NEM) scheme, that took effect on 1 January. Under the revised scheme, prosumers can sell excess solar PV electricity to the grid on a one-on-one offset basis at TNB's retail electricity tariff rates instead of on a displaced cost basis with lower tariff rates. As a result, 125 licences were issued in 2019 as compared to 37 licences in 2018.

To facilitate RE consumption, a premium tariff scheme for consumers wanting to buy green energy was introduced. The scheme provides consumers with the option of buying green energy from RE sources with a premium of 8 sen/kWh without the need to install their own RE generation system.

RE capacity will also be boosted following the Ministry's approval of a 10-Year Generation Plan for Peninsular Malaysia and Sabah, covering the period of 2020 to 2030. Both plans give priority to increasing the share of RE in the capacity mix. The emphasis is on solar energy in Peninsular Malaysia and hydro in Sabah. Fossil fuel-based generation is projected to decline from 82% in 2020 to 70% in 2030.

PERUTUSAN PENGERUSI

Terdapat perkembangan yang menggalakkan dalam bidang kecekapan tenaga juga. Pada 2019, Kerajaan memutuskan supaya lebih daripada 100 pejabat Kerajaan mematuhi piawaian Intensiti Tenaga Bangunan (BEI), iaitu tanda aras antarabangsa yang mengukur prestasi penggunaan tenaga bangunan-bangunan. Dengan penerajuan oleh Kerajaan ini, dijangkakan sektor swasta akan turut sama mengurangkan penggunaan tenaga di bangunan-bangunan.

ST, dengan sokongan Kementerian, juga telah menderaf Rang Undang-undang Kecekapan dan Konservasi Tenaga yang dijadual akan dibentangkan di Parlimen pada tahun 2021 . Rang Undang-undang ini bertujuan untuk mewujudkan rangka kerja perundangan yang menyeluruh bagi mengawalselia, menguatkuasa, menyelaras dan melaksanakan amalan kecekapan tenaga. Ia meliputi jenis tenaga yang lebih luas, termasuk tenaga termal.

Dari perspektif ekonomi tenaga, secara umumnya, purata harga sebenar bahan api pada 2019 adalah lebih tinggi berbanding harga tarif asas di bawah kerangka Kawal Selia Berasaskan Insentif (IBR), di mana surcaj ICPT tarif perlu dilaksanakan. Bagaimanapun, trend harga arang batu telah menurun menuju ke hujung tahun.

2019 adalah tahun penting bagi matlamat kecekapan ekonomi apabila pada tahun ini harga gas asli mencapai paras harga pasaran rujukan, menandakan satu kemajuan signifikan dalam inisiatif liberalisasi pasaran gas. Struktur tarif bagi membolehkan penggunaan kemudahan gas tempatan oleh pihak ketiga di bawah kerangka Akses Pihak Ketiga (TPA) gas juga telah diluluskan pada 2019 bagi tempoh regulatori pertama IBR (2020-2022) . Harga gas asli bagi sektor bukan tenaga untuk dua tahun akan datang telah ditentukan Kerajaan untuk meringankan impak ketidaktentuan harga pasaran ke atas industri.

Suatu lagi pencapaian pembukaan pasaran yang penting adalah kejayaan percubaan operasi komersial TPA bagi gas. Pada bulan Oktober, kargo pertama Gas Asli Cecair (LNG) yang diimport telah tiba di Terminal Penggasan Semula Petronas Sungai Udang di Melaka untuk dihantar ke stesen-stesen janakuasa TNB. TNB telah melaporkan penjimatan hampir RM6 juta melalui pembelian LNG di pasaran terbuka ini.

There were encouraging developments in the area of energy efficiency too. In 2019, the Government decided that more than 100 Government offices are to comply with the Building Energy Intensity (BEI) standard, the international benchmark to measure the energy consumption performance of buildings. With the Government taking the lead, it is anticipated that the private sector will also follow suit to reduce energy consumption in buildings.

The Commission, with the support of the Ministry, has also drafted the Energy Efficiency and Conservation Bill, scheduled to be tabled in Parliament in 2021. The bill aims to establish a comprehensive legal framework to regulate, enforce, coordinate and implement energy efficiency practices. It covers a wider scope of energy types, including thermal energy.

From the perspective of energy economics, generally, average actual fuel prices in 2019 were higher than base tariff prices under the Incentive-Based Regulatory (IBR) framework, necessitating Tariff Imbalance Cost Pass-Through (ICPT) surcharges to be implemented. Nevertheless, coal prices were on a downtrend towards the end of the year.

2019 was an important year for our economic efficiency goal as the regulated price of natural gas reached reference market price level during the year, marking a significant progress in gas market liberalisation initiatives. The tariff structure to enable utilisation of local natural gas facilities by third parties under the gas Third Party Access (TPA) framework was also approved for IBR's first regulatory period (2020-2022). Natural gas price for the non-power sector for the next two years was decided by the Government to soften the impact of fluctuating market prices on industries.

Another important market opening achievement was the successful trial commercial operation of the gas TPA arrangement. In October, the first cargo of imported Liquefied Natural Gas (LNG) arrived at Petronas Sungai Udang Regasification Terminal in Melaka for delivery to TNB's power plants. TNB reported savings of approximately RM6 million from buying LNG in the open market.

CHAIRMAN'S MESSAGE

Dari segi tahap daya harap, keselamatan dan kualiti perkhidmatan industri pembekalan elektrik dan gas berpaip yang telah dicapai pada 2019, keseluruhannya, petunjuk-petunjuk prestasi industri menunjukkan bahawa terdapat peningkatan prestasi dari segi SAIDI dan kadar kejadian kemalangan. Bagaimanapun, isu-isu berkaitan pemeteran elektrik telah meningkat dengan mendadak pada 2019 disebabkan masalah dalam sistem TNB. Di Sabah, inisiatif-inisiatif strategik jangka panjang bagi transformasi industri perlu dilaksanakan dengan segera bagi meningkatkan prestasi SESB dari segi daya harap, keselamatan dan kewangan ke tahap yang baik.

Dalam usaha untuk mencapai peningkatan prestasi melalui transformasi industri, ST perlu bersedia untuk menghadapi cabaran-cabaran transformasi baharu dari segi teknikal, ekonomi, pengawalseliaan dan kapasiti di bawah persekitaran MESI 2.0 dan juga IR4.0. Dalam hubungan ini, di samping memanfaatkan pengalaman yang diperolehi daripada peranan ST sebagai pihak berkuasa dalam pelaksanaan MESI 1.0, ST juga perlu menjadikan amalan-amalan terbaik antarabangsa sebagai panduan dalam mengatasi cabaran getir ini pada masa hadapan.

Bagi mengakhiri perutusan ini, saya ingin mengambil kesempatan ini untuk merakamkan setinggi-tinggi penghargaan kepada Menteri, Timbalan Menteri, pihak Kementerian dan Ahli-Ahli ST, yang telah memberikan bimbingan dan sokongan yang amat berharga kepada saya dan ST di sepanjang tempoh perkhidmatan saya. Terima kasih juga kepada agensi-agensi kerajaan, penggiat industri, pihak pengguna dan pihak awam atas kerjasama.

Ucapan setinggi penghargaan dan terima kasih khas saya kepada semua pegawai dan kakitangan ST serta barisan Pengurusan atas dedikasi, sokongan dan kerjasama. Ucapan takziah kita kepada keluarga mantan Ketua Pegawai Eksekutif ST, Allahyarham Dato' Ir. Hj. Azhar Omar, yang telah kembali ke Rahmatullah pada Disember 2019. Sumbangan besarnya kepada ST dan sektor tenaga akan terus dikenang. Semoga rohnya dirahmati Allah dan ditempatkan bersama para solehin.

Akhir kata, saya ingin mengucapkan ucapan selamat datang kepada pengganti saya, YBhg Dato' Azian Osman dan Ahli-Ahli ST yang baharu, yang mana pengalaman dan wawasan mereka sudah tentu akan meningkatkan lagi keberkesanan Suruhanjaya Tenaga sebagai pengawal selia sektor tenaga yang bertaraf dunia.

DATUK IR AHMAD FAUZI HASAN

As regards to the level of supply reliability, safety and service quality of the electricity and piped gas supply industries achieved in 2019, overall, industry performance indicators show that there were improvements in terms of SAIDI and accident incidence rates. Nevertheless, electricity metering-related issues spiked in 2019 due to problems in TNB's system. In Sabah, strategic long-term industry transformation initiatives need to be undertaken urgently to effectively raise the reliability, safety and financial performance of SESB to good performance levels.

In efforts to achieve better performance through industry transformation, I believe we are prepared to face new transformation challenges with respect to technical, economic, regulatory and capacity under the new MESI 2.0 as well as IR4.0 environments. In this regard, while experience gained from our role as the implementing authority of MESI 1.0 will be invaluable, we should also be guided by international best practices to help us surmount these tough challenges ahead.

As I end this message, I wish to take this opportunity to express my utmost appreciation to our Ministers, Deputy Ministers, Ministry officials and Members of the Commission, whose guidance and support have been invaluable to myself and the Commission, throughout my tenure here. Thank you too to government agencies, industry players, consumers and the public for your cooperation.

My utmost appreciation and special thanks to our staff and the management team for their dedication, support and cooperation. Our deepest condolences to the family of our former Chief Executive Officer, *Allahyarham* Dato' Ir. Hj. Azhar Omar, who passed away in December 2019. His enormous contributions to the Commission and the energy sector will long be remembered. May his soul be blessed by Allah and placed with the *solehin*.

Last but not least, I wish to extend a warm welcome to my successor, YBhg Dato' Azian Osman and the Commission's new members, whose experience and insights will no doubt enhance the effectiveness of the Energy Commission as a world class energy regulator.

ULASAN KETUA PEGAWAI EKSEKUTIF

CHIEF EXECUTIVE OFFICER'S REVIEW

Sebagai pengawal selia industri elektrik dan gas berpaip, ST diamanahkan oleh Kerajaan untuk melaksanakan dasar tenaga negara yang melindungi dan memanfaatkan pengguna tenaga dalam pelbagai segmen domestik, komersial dan industri; juga untuk menjaga dan melindungi alam sekitar serta menyokong pertumbuhan ekonomi negara.

As the regulator of the electricity and piped gas supply industry, the Commission is entrusted by the Government to implement the national energy policy in order to protect and benefit consumers in the domestic, commercial and industrial segments, the environment as well as to support the country's economic growth.

Pada 2019, industri pembekalan elektrik Malaysia telah memperolehi pengiktirafan global apabila Bank Dunia, berasaskan hasil kajian *Ease of Doing Business 2020* yang dijalankan, telah menyenaraikan Malaysia di tangga ke-12 iaitu peningkatan sebanyak tiga tangga berbanding 2018. Di bawah kategori *Getting Electricity*, kedudukan Malaysia di kalangan 190 negara di dunia yang dikaji telah meningkat daripada tangga kelima kepada tangga keempat yang terbaik selepas Emiriah Arab Bersatu (UAE), Korea dan Hong Kong. Penilaian tersebut dibuat berdasarkan proses, tempoh masa dan kos yang diperlukan untuk mendapat bekalan elektrik bagi gudang yang baharu dibina.

Pada November 2019, Kabinet telah meluluskan Pelan Pembangunan Penjanaan Semenanjung Malaysia yang telah diperakui oleh Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif (JPPPET). Pelan tersebut menyediakan unjuran peningkatan permintaan elektrik bagi tempoh 20 tahun yang akan datang, dengan mengambil kira *parameter* ekonomi, unjuran kapasiti penjanaan bagi memenuhi permintaan dan dimensi Trilema Tenaga yang melibatkan faktor keberterusan, kemampuan dan kemampanan.

In 2019, the Malaysian electricity supply industry gained global recognition when the World Bank's study entitled "Ease of Doing Business 2020" ranked Malaysia at 12th place, a rise of three places from the previous year. Under the category "Getting Electricity", Malaysia's ranking moved up, from fifth to fourth best in the world, after the United Arab Emirates, Korea and Hong Kong, among the 190 economies measured. The evaluation was based on the process, time and cost required to obtain electricity supply for newly built warehouses.

In November 2019, the Cabinet approved the Peninsular Malaysia Generation Development Plan which was affirmed by the *Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif* (JPPPET). The Plan provides projections of the electricity demand growth over a 20-year period, taking into account economic parameters, projections of generation capacity to meet demand, and Energy Trilemma dimensions that relate to security, affordability and sustainability.

Trilema Tenaga merupakan cabaran industri pembekalan elektrik, yang sentiasa berubah dan memerlukan pertimbangan yang bijaksana dalam membuat keputusan dan timbang-tara dalam mencari keseimbangan di antara keberterusan tenaga, kemampuan dan kemampanan alam sekitar. Perancangan penjanaan tenaga telah mengambil kira Trilema ini dalam keseluruhan proses perancangan, pelaksanaan dan penerimagunaan dasar-dasar Kerajaan.

Stesen janakuasa Tuanku Muhriz, yang sebelum ini dikenali sebagai Jimah East Power, telah memulakan operasi komersialnya (COD) pada Disember 2019 dengan jumlah kapasiti sebanyak 2,000MW. Peringkat awal COD stesen ini pada Ogos 2019 telah menyaksikan penjanaan 1,000MW pertamanya, sekali gus meningkatkan jumlah kapasiti terpasang di Semenanjung Malaysia kepada 26,132MW. Stesen penjanaan arang batu Tuanku Muhriz ini menggunakan teknologi *ultra-supercritical* (USC) yang mempunyai kadar kecekapan sebanyak 40%, berbanding 36% bagi loji janakuasa arang batu konvensional.

Gas asli merupakan salah satu sumber bahan api yang dominan bagi sektor tenaga di mana ianya juga merupakan alternatif bahan api yang lebih bersih. Memandangkan rizab gas asli negara semakin menyusut dan permintaan domestik terus meningkat, terutamanya bagi sektor tenaga di Semenanjung Malaysia, negara kita telah mula mengimport Gas Asli Cecair (LNG) sejak 2013 lagi. Walau bagaimanapun, kini melalui pembukaan pasaran gas atau Akses Pihak Ketiga (TPA), kami menjangkakan kewujudan lebih ramai pemain dalam industri gas di Malaysia.

The Energy Trilemma has been an ongoing challenge for the electricity supply industry, which is continuously evolving, and requires judicious decision making and trade-offs to balance energy security, affordability and environmental sustainability. The planning of power generation has considered this Trilemma throughout the planning, implementation and adoption of Government's policies.

The Tuanku Muhriz power station, formerly known as Jimah East Power, marked its commercial operation date (COD) in December 2019, with a total capacity of 2,000MW. Earlier, with the the COD in August 2019, it had achieved its first 1,000MW, increasing the total installed capacity in Peninsular Malaysia to 26,132MW. The coal-fired Tuanku Muhriz power station utilises the ultra-supercritical (USC) technology that has an efficiency rate of 40%, compared to 36% for conventional coal-fired power plants.

Natural gas is one of the dominant fuel sources in the power sector; it is also the cleaner alternative among fossil fuels. Since natural gas reserves in the country are slowly depleting, while domestic demand continues to rise especially for the power sector in Peninsular Malaysia, we have started importing Liquefied Natural Gas (LNG) as far back as 2013. With the opening up of the gas market in recent years, or better known as the Third Party Access (TPA), we expect more gas players to be present in Malaysia.

ULASAN KETUA PEGAWAI EKSEKUTIF

ST meneruskan usaha-usahanya untuk meningkatkan ketelusan serta memperketatkan pemantauan dan tadbir urus dengan melaksanakan mekanisme Kawal Selia Berasaskan Insentif (IBR) dan *Imbalance Cost Pass-Through* (ICPT) bagi menetapkan tarif elektrik di Semenanjung Malaysia. Sepanjang Tempoh Kawal Selia Kedua (RP2) iaitu daripada 2018 sehingga 2020, TNB sebagai entiti bisnes yang dikawal selia, turut patuh dengan peraturan-peraturan yang digariskan di dalam *Guidelines on Electricity Tariff Determination under Incentive-based Regulation (IBR) for Peninsular Malaysia 2018*.

Mekanisme ICPT menyediakan semakan harga bahan api setiap enam bulan yang akan menentukan rebat atau surcaj kepada pengguna. Bagi tempoh Januari hingga Jun 2019, mekanisme ICPT menetapkan purata surcaj sebanyak 2.15 sen/kWj sementara bagi tempoh Julai hingga Disember 2019 pula, purata surcaj sebanyak 2.55 sen/kWj telah ditetapkan kepada pengguna bukan domestik. Surcaj tersebut dikenakan kerana kos sebenar bahan api adalah lebih tinggi daripada unjuran kos bahan api ketika kadar asas tarif ditetapkan. Melalui pelaksanaan berterusan mekanisme IBR dan ICPT, persekitaran kawal selia bagi penetapan dan pelarasan tarif elektrik di Semenanjung Malaysia menjadi lebih stabil. Ini dijangka akan mencetuskan keyakinan pelabur terhadap industri tenaga negara.

Kerajaan, ketika meluluskan pelaksanaan surcaj ICPT untuk kedua-dua tempoh tersebut, telah mengambil keputusan supaya tiada pengenaan surcaj ke atas pengguna domestik atau kediaman. Dengan menggunakan peruntukan bernilai RM415 juta daripada dana Kumpulan Wang Industri Elektrik (KWIE) untuk menampung surcaj ini, pengenepian surcaj ini bertujuan untuk mengurangkan beban peningkatan jumlah bil elektrik yang ditanggung oleh pengguna kediaman. Sementara itu, bagi pengguna bukan domestik, khususnya pengguna komersial dan industri, sejumlah RM900 juta dana KWIE telah digunakan untuk menampung sebahagian daripada kadar surcaj ICPT sebenar.

Dengan ini, keseluruhan dana KWIE yang digunakan untuk menampung kos surcaj ICPT pada 2019 adalah sebanyak RM1.3 bilion. Dana KWIE yang diterima adalah melalui pelarasan pendapatan TNB dan penjimatan lain melalui mekanisme pengebilan gas.

Berikutan proses digitalisasi, Kerajaan telah memperkenalkan *Advanced Metering Infrastructure* (AMI) atau Meter Pintar sebagai salah satu inisiatif yang bertujuan untuk menggalakkan dan memperkasakan pemilik rumah supaya mengurus dan mengawasi penggunaan elektrik harian mereka melalui suatu aplikasi mobil atau laman web yang disediakan oleh pihak utiliti. Setakat Disember 2019, sejumlah 281,066 meter pintar telah berjaya dipasang. Di bawah tempoh kawal selia RP2, jumlah sasaran pemasangan adalah sebanyak 1.5 juta meter pintar di Melaka dan Lembah Klang.

The Commission continues its efforts to increase transparency, strict monitoring and governance by implementing the Incentive-based Regulation (IBR) and Imbalance Cost Pass-Through (ICPT) mechanisms for the determination of electricity tariffs in Peninsular Malaysia. During the Second Regulatory Period (RP2) which is between 2018 and 2020, TNB as a regulated business entity is required to comply with the rules prescribed in the Guidelines on Electricity Tariff Determination under Incentive-based Regulation (IBR) for Peninsular Malaysia 2018.

The ICPT mechanism provides for half yearly fuel price reviews that can result in either rebates or surcharges for consumers. For the period January to June 2019, the ICPT mechanism imposed an average surcharge of 2.15 sen/kWh, and for the period July to December 2019, it was an average surcharge of 2.55 sen/kWh for non-domestic consumers. The surcharges were due to actual fuel costs being higher than the fuel costs projected when setting the base tariff rate. Through the continuous implementation of the IBR and ICPT mechanisms, there is greater stability in the regulatory environment of the electricity tariff setting and adjustments in Peninsular Malaysia, and this is expected to boost investor confidence in the national energy industry.

When deciding on the implementation of the ICPT surcharge rate for both periods, the Government decided not to impose a surcharge on domestic or residential consumers by leveraging on the Electricity Industry Fund (KWIE) to a value of RM415 million. This exclusion was aimed at alleviating the burden of high electricity bills on households. Meanwhile, for non-domestic consumers, namely, commercial and industrial consumers, RM900 million of the KWIE funds was used to cover part of the actual ICPT surcharge rate.

With this, the total KWIE funds used to cover the ICPT surcharge cost in 2019 was RM1.3 billion, received through TNB revenue adjustment and other savings such as the gas billing mechanism.

As part of digitalisation, the Advanced Metering Infrastructure (AMI) or Smart Meter is also one of the Government's initiatives to empower homeowners to manage and view their daily electricity consumption via a mobile application or the web portal provided by the utility company. As at December 2019, a total of 281,066 smart meters had been successfully installed. The target is for 1.5 million smart meters to be installed in Melaka and the Klang Valley during RP2.

CHIEF EXECUTIVE OFFICER'S REVIEW

Usaha peningkatan kemampanan alam sekitar terus menjadi keutamaan negara kami sejak Malaysia memperbaharui ikrar di sesi ke-21 *Conference of the Parties* (COP21) di Paris. Berdasarkan laporan *Third National Communication* yang dikeluarkan, lebih daripada tiga per empat pelepasan gas rumah hijau (GHG) adalah daripada sektor tenaga, dan daripada jumlah tersebut, 39% khususnya adalah daripada aktiviti penjanaan elektrik. Sebagai langkah mengawal pelepasan GHG daripada aktiviti penjanaan elektrik, Kerajaan telah memperkenalkan program Solar Berskala Besar (LSS) dan skim Pemeteran Tenaga Bersih (NEM).

Kitaran ketiga bagi pembidaan LSS (LSS3) telah dilancarkan pada Februari 2019 dengan jangkaan nilai bidaan berjumlah RM2 bilion. Lebih kurang 500MW yang dianugerahkan oleh ST kepada pembida telah meningkatkan sumbangan Tenaga Boleh Baharu (TBB) di dalam campuran kapasiti penjanaan di Malaysia. Pada 2019, TBB telah menyumbang sebanyak 7% kepada jumlah keseluruhan kapasiti penjanaan terpasang. Ini telah meningkatkan bahagian TBB di dalam campuran kapasiti, selaras dengan sasaran negara untuk mencapai 20% TBB dalam campuran kapasiti menjelang 2025.

Intensiti pelepasan karbon (daripada KDNK) bagi sektor tenaga di Semenanjung Malaysia dijangka akan mengalami trend penurunan, iaitu sebanyak 47% menjelang 2030, berbanding dengan tahap penurunan pada 2005. Ini adalah selaras dengan komitmen Malaysia di COP21. Intensiti pembekalan elektrik di Semenanjung Malaysia dan Sabah telah bertambah baik pada 2019, iaitu 0.0988 GWj/RM juta (2018: 0.1005 GWj/RM juta) bagi Semenanjung Malaysia dan 0.0538 GWj/RM juta (2018: 0.0538 GWj/RM juta) bagi Sabah. Peningkatan ini adalah hasil daripada pelaksanaan inisiatif di bawah Pelan Tindakan Kecekapan Tenaga Nasional (NEEAP), yang menyaksikan jumlah penjimatan tenaga sebanyak 2.08% pada 2019.

Melihat kepada potensi penjimatan yang dapat diperolehi, Kerajaan telah mengambil initiatif menderaf rang undang-undang bagi Akta Kecekapan dan Konservasi Tenaga (EECA). Undang-undang baharu yang dicadangkan ini bukan sahaja akan merangkumi sektor elektrik tetapi juga diperluaskan untuk meliputi tenaga termal. Rang undang-undang tersebut dijadual akan dibentangkan di Parlimen pada 2021. Proses menderaf EECA telah bermula pada 2019, di mana konsultasi telah diadakan bersama pemegang taruh bagi mengenal pasti cabaran dan trend baharu yang perlu diatasi untuk memastikan rang undang-undang tersebut dapat mencapai dan memenuhi objektif dan manfaat penggubalannya kepada semua pemegang taruh.

Environmental sustainability has increased in terms of its significance in Malaysia since our renewed pledge at the 21st session of the Conference of the Parties (COP21) held in Paris. Based on the Third National Communication Report, over three quarters of greenhouse gas (GHG) emissions come from the energy sector. Out of this total, 39% was contributed by electricity generation alone. To mitigate GHG emissions from electricity generation, the Government has introduced the Large Scale Solar (LSS) programme and Net Energy Metering (NEM) scheme.

The third cycle for the LSS (LSS3) bidding was launched in February 2019 with an estimated bid worth of RM2 billion. A total of approximately 500MW awarded by the Commission has boosted the share of Renewable Energy (RE) in the generation capacity mix in Malaysia. As of 2019, RE made up 7% of the total generation installed capacity. This resulted in an increase of RE in the capacity mix, which is in line with the national target of achieving 20% RE in the capacity mix by 2025.

Carbon emission intensity (of GDP) for the power sector in Peninsular Malaysia is projected to be on a downward trend with a 47% reduction by 2030 compared to the 2005 level, which is in line with Malaysia's commitment at the COP21. Electricity intensity for Peninsular Malaysia and Sabah improved in 2019. It stood at 0.0988 GWh/RM million (2018: 0.1005 GWh/RM million) for Peninsular Malaysia and 0.0538 GWh/RM million (2018: 0.0538 GWh/RM million) for Sabah. The improvement was due to the National Energy Efficiency Action Plan (NEEAP) initiatives, which saw total energy savings amounting to 2.08% in 2019.

Looking at the potential savings that can be achieved, the Government has initiated the drafting of the bill for the Energy Efficiency and Conservation Act (EECA). The proposed new legislation will not only cover the electricity sector but will also extend to thermal energy. The bill is scheduled to be tabled in Parliament in 2021. The drafting of the EECA has commenced and in 2019, stakeholder consultations were held to identify emerging trends and challenges to overcome and to ensure that the bill meets the intended objectives and benefits for all stakeholders.

ULASAN KETUA PEGAWAI EKSEKUTIF

Di bawah Rancangan Malaysia ke-11 (2016-2020), Kerajaan telah memperkenalkan Program Geran Audit Tenaga Bersyarat (EACG) yang menyediakan bantuan kewangan kepada sektor industri dan komersial yang merancang untuk melaksanakan langkah-langkah penjimatan tenaga. Sejumlah RM165 juta telah diperuntukkan untuk tujuan ini. Sepanjang tempoh 2016 hingga 2019, sebanyak RM21.02 juta daripada jumlah tersebut telah disalurkan kepada pengguna tenaga besar yang berkelayakan.

Pada 2019, penjimatan bil elektrik berjumlah RM5.5 juta telah berjaya dicapai hasil daripada usaha pengubahsuaian bangunan awam. Sebanyak 150 bangunan Kerajaan juga telah dikenalpasti di bawah inisiatif Intensiti Tenaga Bangunan (BEI), sekali gus mempelopori program Pelabelan Prestasi BEI Kebangsaan yang bertujuan untuk mengurangkan penggunaan tenaga di negara ini.

Secara asasnya, ST berperanan memantau kualiti perkhidmatan yang ditawarkan oleh utiliti pembekal, iaitu TNB, yang perlu mematuhi Tahap Perkhidmatan Dijamin (GSL) dan Tahap Perkhidmatan Minimum (MSL) seperti di dalam lesen operasi mereka. Prestasi pematuhan GSL TNB bagi 2019 telah meningkat kepada 98.66% (2018: 94.38%) sementara pematuhan MSL pula telah meningkat kepada 94.24% (2018: 89.36%).

ST juga telah menjalankan kajian Indeks Kepuasan Pelanggan (CSI) untuk mengukur prestasi penyampaian perkhidmatan ST dan telah memperolehi skor sebanyak 86.8%. Ini merupakan suatu peningkatan berbanding skor sebanyak 79.7% yang telah diperolehi pada 2018. Di samping itu, pada Julai 2019, ST juga telah melancarkan laman mikro Aduan Pelanggan, yang bertujuan untuk mendapatkan cara-cara terbaik untuk mempertingkatkan kualiti perkhidmatan penyelesaian aduan pelanggan. Pada Februari 2019, ST telah ditauliahkan pensijilan Sistem Pengurusan Kualiti ISO 9001:2015, yang memerlukan ST untuk terus membaikpulihkan penyampaian perkhidmatannya serta meningkatkan produktiviti organisasinya.

ST juga mencatatkan keputusan SAIDI terbaik pada 2019. Bagi Semenanjung Malaysia, prestasi ST telah menurun sedikit kepada 48.13 minit/pelanggan/tahun (2018: 48.22 minit/pelanggan/tahun). *Delivery Point Unreliability Index* (DePUI) pula, yang menilai daya harap pemindahan kuasa elektrik daripada sistem penghantaran kepada sistem pengagihan, terus meningkat. Di Semenanjung Malaysia, ianya telah meningkat sebanyak 77%. Pada 2019, prestasi keseluruhan SAIDI di Sabah, walaupun telah menurun daripada tahun sebelumnya, tetap tinggi pada 205.31 minit/pelanggan/tahun. ST bersama Kementerian kini sedang menangani isu ini.

Under the 11th Malaysia Plan (2016-2020), the Government introduced the Energy Audit Conditional Grant (EACG) to provide financial assistance to large industrial and commercial consumers wanting to implement energy savings measures. A total of RM165 million was allocated for this purpose. Between 2016 and 2019, RM21.02 million has been disbursed to qualified large energy consumers.

In 2019, a total of RM5.5 million in electricity bill savings was achieved when public buildings were retrofitted. A total of 150 Government buildings have also been identified under the Building Energy Intensity (BEI) initiative, spearheading the national BEI Performance Labelling programme to reduce energy consumption in the country.

As it stands, the Commission monitors the service quality of utility provider TNB, which is required to comply with Guaranteed Service Levels (GSL) and Minimum Service Levels (MSL) set out in their operating licence. TNB's GSL compliance improved to 98.66% (2018: 94.38%) while the MSL compliance improved to 94.24% (2018: 89.36%) during the year.

The Commission also carried out a Customer Satisfaction Index (CSI) survey to gauge our service delivery performance and scored 86.8%. This was an improvement over our 79.7% score in 2018. In addition, in July we launched the Customer Complaints microsite for insights on how to improve the quality of complaints handling. Earlier in February, we were awarded the ISO 9001:2015 Quality Management System certification, which required us to make continuous improvements to our service delivery as well as to increase our organisational productivity.

We recorded the best ever SAIDI results in 2019. In the Peninsular, it fell marginally to 48.13 minutes/customer/year (2018: 48.22 minutes/customer/year). The Delivery Point Unreliability Index (DePUI), which measures the reliability of power transfer from the transmission system to the distribution system, continued to improve. In Peninsular Malaysia, it improved by 77%. In 2019, the overall SAIDI performance in Sabah although declined from the previous year remains high at 205.31 minutes/customer/year. The Commission has been working together with the Ministry to address this issue.

CHIEF EXECUTIVE OFFICER'S REVIEW

Tahun ini turut mencatatkan penurunan jumlah kes kemalangan maut elektrik, iaitu sebanyak 15 kemalangan berbanding 28 kemalangan pada 2018. Talian atas voltan tinggi, stesen janakuasa utiliti dan premis industri merupakan antara tiga lokasi tertinggi berlakunya kemalangan elektrik. Bagi kemalangan gas berpaip, kebanyakan kemalangan tanpa maut berlaku di kedai dobi, berpunca daripada pepasangan gas berpaip tanpa kebenaran. Untuk mengatasi masalah ini, ST telah mengeluarkan *Guidelines in Gas Piping Systems at Launderettes and Similar Installations*.

Sebagai sebahagian daripada usaha ST untuk memupuk kesedaran tentang keselamatan tenaga, kami turut mengadakan sesi-sesi dialog bersama pihak-pihak yang terlibat bagi memastikan pematuhan terhadap garis panduan keselamatan tenaga. ST juga telah menerbitkan garis panduan khusus untuk industri bertujuan untuk memaklumkan, mendidik dan menangani isu-isu pematuhan dan kemalangan. Pada 2019, sebanyak lima penerbitan sedemikian telah diterbitkan dan boleh didapati di laman web ST.

Sebagai penutup, saya ingin merakamkan ucapan terima kasih kepada semua pihak atas sokongan padu yang telah diberikan, terutamanya kepada Pengerusi yang berpengalaman luas dan amat kami hormati, Datuk Ir. Ahmad Fauzi Hasan, atas segala sumbangan bermakna dan bernilai beliau kepada ST dan industri. Saya ingin mengucapkan ribuan terima kasih atas bimbingan yang telah diberikan dan mendoakan segala limpahan kesejahteraan di dalam persaraan beliau. Saya juga ingin mengambil kesempatan ini untuk mengucapkan selamat datang kepada Pengerusi baharu kami, Dato' Azian Osman, yang telah dilantik pada 8 Mei 2020.

Saya juga ingin merakamkan penghargaan kepada pihak Kementerian-kementerian, ahli-ahli ST, agensi-agensi Kerajaan, para penggiat industri serta masyarakat awam atas sokongan yang diberikan dalam membantu ST memenuhi dan menjayakan tanggungjawab yang diamanahkan, demi kepentingan negara. Saya juga ingin merakamkan penghargaan kepada barisan pengurusan dan kakitangan ST di atas dedikasi dan komitmen yang ditunjukkan demi meneruskan prestasi dan kecemerlangan ST.

ABDUL RAZIB DAWOOD

The year also recorded fewer fatal accidents, with 15 in 2019 compared to 28 in 2018. High voltage overhead lines, utility substations and industrial premises were among the top three locations for electrical accidents. In the case of piped gas accidents, the majority of non-fatal accidents occurred at launderettes because of unauthorised gas installations. To mitigate this problem, the Commission has issued the Guidelines in Gas Piping Systems at Launderettes and Similar Installations.

As part of our efforts in creating safety awareness, we also conducted dialogues with the parties involved to ensure safety guidelines and compliances are met. The Commission also published industry-specific guidelines to inform, educate and address compliance and accident issues. In 2019, we produced five such publications and they are available on our website.

In closing, I wish to thank everyone for their encouraging support, especially our respected and knowledgeable chairman, Datuk Ir. Ahmad Fauzi Hasan, who has made invaluable contributions to the Commission and the industry. I thank him for his guidance and wish him many happy years in retirement. I would also like to take this opportunity to welcome our new Chairman, Dato' Azian Osman, who was appointed on 8 May 2020.

I also wish to thank our Ministries, the members of the Commission, Government agencies, industry players and the public for their support in assisting the Commission to execute its responsibilities for the best interest of the country. My appreciation also goes out to my management team and staff members for their dedication and commitment to continuously improve the Commission's performance.

MAKLUMAT KORPORAT
CORPORATE INFORMATION

VISI
VISION

Suruhanjaya Tenaga adalah badan kawal selia sektor tenaga bertaraf dunia yang berkesan serta berwibawa.

The Energy Commission is a world class energy regulator that is effective and authoritative.

MISI
MISSION

Suruhanjaya Tenaga berazam untuk mengimbangi keperluan pengguna dan pembekal tenaga bagi memastikan pembekalan yang selamat dan berdaya harap pada harga yang berpatutan, melindungi kepentingan awam, dan menggalakkan pembangunan ekonomi dan pasaran yang kompetitif dalam persekitaran yang lestari.

The Energy Commission aims to balance the needs of consumers and providers of energy to ensure safe and reliable supply at reasonable prices, protect public interest, and foster economic development and competitive markets in an environmentally sustainable manner.

NILAI TERAS
CORE VALUES

KECEMERLANGAN
EXCELLENCE

KEBOLEHARAPAN
RELIABILITY

KETULUSAN DAN KESAKSAMAAN
SENSE OF FAIRNESS AND FAIRPLAY

MENGENAI SURUHANJAYA TENAGA
ABOUT THE ENERGY COMMISSON

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001, ST bertanggungjawab mengawal selia sektor tenaga, khususnya industri pembekalan elektrik dan gas berpaip di Semenanjung Malaysia dan Sabah.

Mengambil alih peranan Jabatan Bekalan Elektrik dan Gas, ST mula beroperasi sepenuhnya pada 1 Januari 2002. Fokus utama ST adalah bekalan elektrik dan gas yang berdaya harap, kos yang munasabah dan selamat digunakan.

Peranan ST terbahagi kepada tiga iaitu Kawal Selia Ekonomi, Kawal Selia Teknikal dan Kawal Selia Keselamatan.

A statutory body established under the Energy Commission Act 2001, ST or the Commission is responsible for regulating the energy sector, specifically the electricity and piped gas supply industries, in Peninsular Malaysia and Sabah.

Taking over the role of the Department of Electricity and Gas Supply, the Commission started its operation on January 1, 2002. The main focus of the Commission is reliable electricity and gas supply, reasonable costs and safety.

The role of the Commission is divided into three, namely Economic Regulation, Technical Regulation and Safety Regulation.

KAWAL SELIA EKONOMI
ECONOMIC REGULATION

Untuk menggalakkan keekonomian dalam penjanaan, penghantaran, pengagihan, pembekalan dan penggunaan elektrik dan dalam retikulasi dan penggunaan gas; menggalakkan persaingan; membolehkan pengendalian pasaran yang adil dan cekap dan mencegah penyalahgunaan monopoli atau kuasa pasaran dalam industri elektrik dan gas berpaip.

To promote economy in the generation, transmission, distribution, supply and use of electricity and in the reticulation and use of gas; promote competition; enable fair and efficient market conduct and prevent the misuse of monopoly or market power in the electricity and piped gas industries.

KAWAL SELIA TEKNIKAL
TECHNICAL REGULATION

Untuk memastikan keberterusan, daya harap, kecekapan dan kualiti bekalan dan perkhidmatan dalam industri elektrik dan bekalan gas berpaip.

To ensure security, reliability, efficiency and quality of supply and services in the electricity and piped gas supply industries.

PERATURAN KESELAMATAN
SAFETY REGULATION

Untuk melindungi industri, pengguna dan orang awam daripada bahaya yang timbul daripada penjanaan, penghantaran, pengagihan, pembekalan dan penggunaan elektrik, serta pengagihan, pembekalan dan penggunaan gas berpaip.

To protect the industry, consumers and public from dangers arising from the generation, transmission, distribution, supply and use of electricity and the distribution, supply and use of piped gas.

FUNGSI DAN KUASA SURUHANJAYA TENAGA
FUNCTIONS AND POWERS OF THE ENERGY COMMISSION

ST hendaklah mempunyai segala fungsi yang dipertanggungkan ke atasnya di bawah undang-undang pembekalan tenaga dan hendaklah juga melaksanakan fungsi-fungsi yang berikut:

The Commission shall have all the functions imposed on it under the energy supply laws and shall also perform the following functions:

1

Menasihati Menteri tentang segala perkara yang berkenaan dengan objektif dasar kebangsaan bagi aktiviti pembekalan tenaga, pembekalan dan penggunaan elektrik, pembekalan gas melalui talian paip dan penggunaan gas.

Advises Ministers on all matters concerning the national policy objectives for energy supply activities, the supply and use of electricity, the supply of gas through pipelines and the use of gas.

2

Mengawal selia tarif elektrik dan gas berpaip dan kualiti perkhidmatan pembekalan, serta menggalakkan persaingan dan mencegah penyalahgunaan monopoli atau kuasa pasaran.

Regulates electricity and piped gas tariffs and the quality of supply services, as well as promotes competition and prevents the misuse of monopoly or market power.

3

Menggalakkan amalan baik, serta penyelidikan, pembangunan dan inovasi dalam industri pembekalan elektrik dan gas berpaip.

Promotes good practices, as well as research, development and innovation in the electricity and piped gas industries.

4

Merancang dan membangunkan undang-undang, peraturan, kod, garis panduan, program bagi memastikan keselamatan, pembangunan dan fungsi yang teratur dalam industri pembekalan elektrik dan gas berpaip.

Plans and develops laws, regulations, rules, codes, guidelines, programmes for the safety, orderly development and functioning of the electricity and piped gas industries.

5

Meluluskan lesen dan perakuan bagi pembekal elektrik dan gas berpaip, orang kompeten elektrik dan gas, pelatih, kontraktor, kelengkapan dan pemasangan, syarikat yang memberikan perkhidmatan tenaga dan pengurus tenaga.

Licenses and certifies electricity and piped gas suppliers, competent electricity and gas personnel, training providers, contractors, equipment and installations, energy service companies and energy managers.

6

Memantau dan mengaudit prestasi dan pematuhan pembekal yang berlesen dan bertauliah, pembekal perkhidmatan, pemasangan, pengimport kelengkapan, pengeluar dan penjual.

Monitors and audits performance and compliance of licensed and certified suppliers, service providers, installations, equipment importers, manufacturers and retailers.

7

Menyiasat aduan, kemalangan, kesalahan dan isu industri; dan menguatkuasa pematuhan.

Investigates complaints, accidents, offences and industry issues; and enforces compliance.

ANGGOTA SURUHANJAYA TENAGA

Dari kiri:
From left:

DATO' DR. ROSLI MOHAMED | **DATUK ANUAR AHMAD**
DATUK IR. AHMAD FAUZI HASAN (Pengerusi/Chairman)
ADLIN ABDUL MAJID | **DR. MOHAMMED SHAHARIN UMAR**

ENERGY COMMISSION MEMBERS

Dari kiri:
From left:

DATUK DR. ONG PENG SU | **ABDUL RAZIB DAWOOD** (Ketua Pegawai Eksekutif/Chief Executive Officer) *1 Ogos/August 2019*
PROFESOR ULUNG DATO' DR. RAJAH RASIAH | **DR. ISMAIL SIMON CHARLES** *15 November 2019*
NOOR AFIFAH ABDUL RAZAK

Tamat Perkhidmatan pada 2019: **DATUK BAHARI HASSAN**
Concluded Service in 2019

PENGURUSAN TERTINGGI

Dari kiri:
From left:

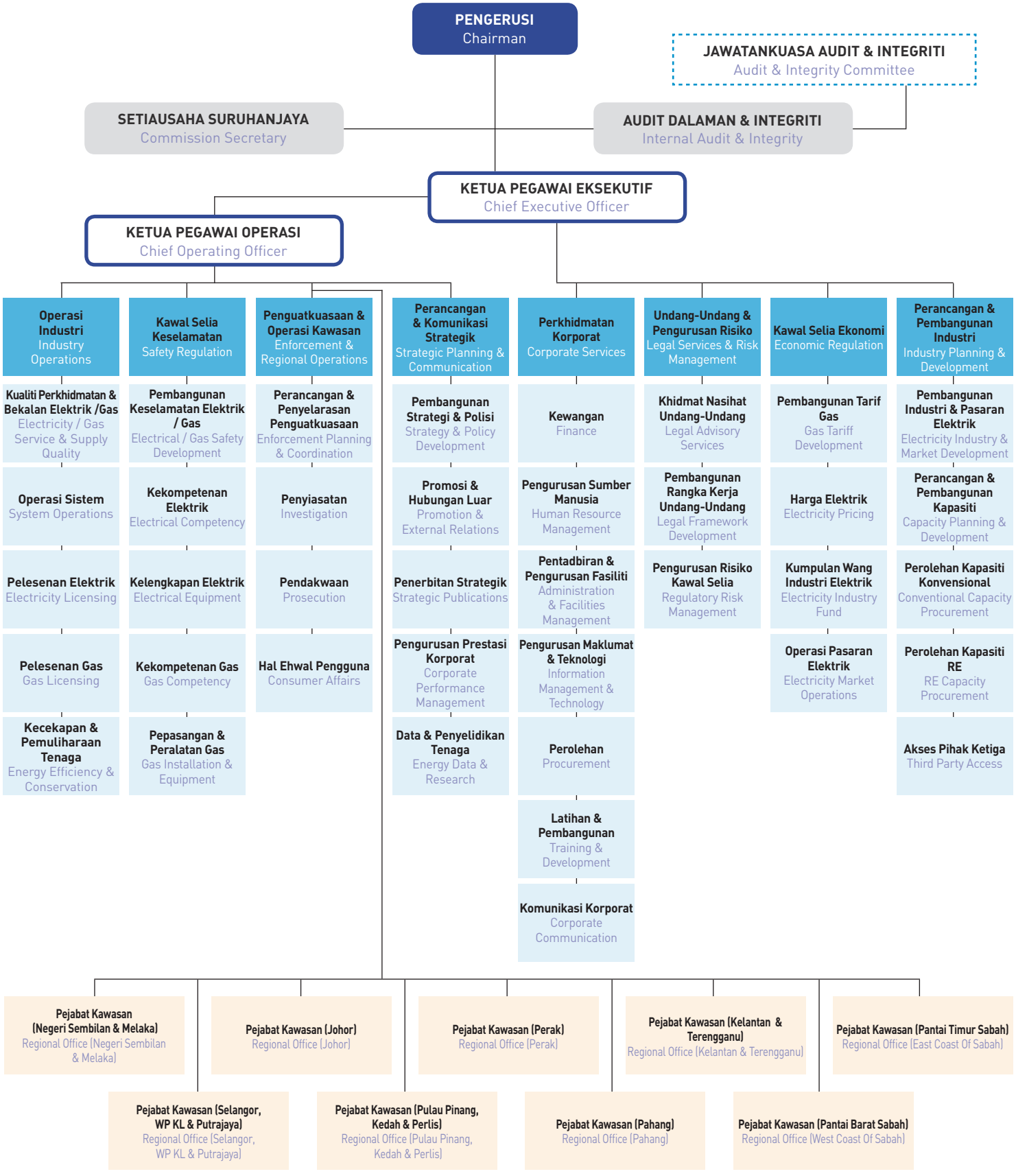
IR. ROSLEE ESMAN | **MOHD ELMI ANAS** | **MARLINDA MOHD ROSLI**
ABDUL RAZIB DAWOOD (Ketua Pegawai Eksekutif/Chief Executive Officer) | **HILMI RAMLI**

MANAGEMENT TEAM

Dari kiri:
From left:

NURHAFIZA MOHAMED HASAN | **IR. ABDUL RAHIM IBRAHIM** (Ketua Pegawai Operasi/Chief Operating Officer)
SHAHRILNAZIM SHAARI | **IR. MD ZAKUAN IBRAHIM** | **ASMA AINI MOHD NADZRI**

STRUKTUR ORGANISASI
ORGANISATION STRUCTURE



MESYUARAT SURUHANJAYA TENAGA 2019

ENERGY COMMISSION MEETINGS 2019

MESYUARAT SURUHANJAYA TENAGA
ENERGY COMMISSION MEETINGS

1. **JANUARI** January
2. **MAC** March
3. **MEI** May
4. **JUN** June
5. **OGOS** August
6. **NOVEMBER** November
7. **DISEMBER** December

MESYUARAT KHAS SURUHANJAYA TENAGA
SPECIAL ENERGY COMMISSION MEETINGS

1. **JUN** June
2. **OGOS** August
3. **SEPTEMBER** September
4. **DISEMBER** December

MESYUARAT JAWATANKUASA BERSAMA PELESENAN (PENGURUSAN DAN SURUHANJAYA TENAGA) (JKBP)
LICENSING COMMITTEE MEETINGS (MANAGEMENT AND THE ENERGY COMMISSION)

1. **JANUARI** January
2. **MAC** March
3. **MEI** May
4. **JUN** June
5. **OGOS** August
6. **NOVEMBER** November
7. **DISEMBER** December

MESYUARAT JAWATANKUASA KEWANGAN DAN TENDER SURUHANJAYA TENAGA (JKKT)
FINANCIAL COMMITTEE AND TENDER MEETINGS

1. **JANUARI** January
2. **MAC** March
3. **JUN** June
4. **OGOS** August
5. **OKTOBER** October
6. **DISEMBER** December

MESYUARAT JAWATANKUASA REMUNERASI DAN NOMINASI SURUHANJAYA TENAGA (JKRN)
ENERGY COMMISSION REMUNERATION AND NOMINATION COMMITTEE MEETINGS

1. **MAC** March
2. **MAC** March
3. **APRIL** April
4. **MEI** May
5. **JUN** June
6. **OGOS** August
7. **NOVEMBER** November
8. **DISEMBER** December

MESYUARAT JAWATANKUASA AUDIT DAN INTEGRITI SURUHANJAYA TENAGA (JKAI)
ENERGY COMMISSION AUDIT AND INTEGRITY COMMITTEE MEETINGS

1. **JANUARI** January
2. **APRIL** April
3. **OGOS** August
4. **DISEMBER** December

MESYUARAT JAWATANKUASA TEKNIKAL SURUHANJAYA TENAGA (JKBT)
ENERGY COMMISSION TECHNICAL COMMITTEE MEETINGS

1. **FEBRUARI** February
2. **APRIL** April
3. **OGOS** August
4. **OKTOBER** October
5. **DISEMBER** December

MESYUARAT JAWATANKUASA EKONOMI SURUHANJAYA TENAGA (JKE)
ENERGY COMMISSION ECONOMIC COMMITTEE MEETINGS

1. **MAC** March
2. **MEI** May
3. **JUN** June
4. **OGOS** August
5. **OKTOBER** October
6. **DISEMBER** December

SETAHUN YANG LALU 2019

JANUARI
JANUARY

8

Seminar Keselamatan Elektrik Touchpoint di Pusat Pengajian Darul Hassanah, Sandakan.
Acara diadakan sempena majlis penutupan program Touchpoint 2018.

Touchpoint Electrical Safety Seminar at Pusat Pengajian Darul Hassanah, Sandakan.
This event was held in conjunction with the closing ceremony of Touchpoint 2018.

FEBRUARI
FEBRUARY

12

ST Energy Talk:"Global Energy Governance, Energy Security and Climate Change" oleh Prof. Dr. Ken Koyama, Kursi Suruhanjaya Tenaga (Ekonomi Tenaga)

Energy Commission Talk "Global Energy Governance, Energy Security and Climate Change" by Prof. Dr. Ken Koyama, Chair of Energy Commission (Energy Economics)

20-21

Twinning Project Involving National Ozone Officers and Energy Policymakers for Energy Efficient and Climate-Friendly Cooling, UNESCO, Paris
Pegawai-pegawai ST dan Jabatan Alam Sekitar menghadiri program UNESCO ini yang membincangkan tindakan dan inisiatif yang telah dilaksanakan oleh negara-negara ahli bagi mengurangkan penggunaan klorofluorokarbon (CFC) yang menjejaskan lapisan ozon.

The Commission and Department of Environment officials attended this UNESCO event that discussed initiatives and actions taken by countries to reduce chlorofluorocarbons (CFCs) that adversely affect the ozone layer.

15

Operasi Bersepadu Banteras Aktiviti Haram (BAH) 2.0
ST menyertai operasi bersepadu anjuran Dewan Bandaraya Kuala Lumpur (DBKL) untuk membanteras aktiviti-aktiviti yang berkaitan dengan kegagalan pematuhan.

Joint OPS BAH 2.0
The Commission participated in this joint operations sponsored by KL City Hall (DBKL) to apprehend activities associated with non-compliance.

22

Program Keselamatan Pengguna 2019, Kuching
ST menyampaikan ceramah bertajuk "Keselamatan Peralatan Elektrik & Kecekapan Tenaga – Peranan Suruhanjaya Tenaga" di program yang dianjurkan oleh Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Pengguna (KPDNHEP) ini.

2019 Consumer Safety Programme, Kuching
The Commission made a presentation on "Safety of Electrical Appliances and Energy Efficiency - The Commission's Role" at this event sponsored by the Ministry of Domestic Trade and Consumer Affairs (KPDNHEP).

A YEAR THAT WAS 2019

MAC MARCH

Program Perantisan MESTECC-ST
Program bersepadu pembangunan kapasiti bersama Kementerian ini melibatkan enam orang mentor dari pihak Pengurusan dan 36 orang kakitangan eksekutif dari pelbagai jabatan sebagai perantis. Program selama 10 bulan ini berakhir pada penghujung 2019.

MESTECC-ST Apprenticeship Programme
This joint capacity development program with the Ministry had six mentors from the Management and 36 executive staff from various departments as apprentices. The 10-month long programme ended at the end of 2019.

APRIL APRIL

2-4

Mesyuarat Majlis *ASEAN Forum on Coal* (AFOC) ke-17
AFOC adalah salah satu daripada rangkaian sub-sektor dan badan-badan pakar tenaga yang bertanggungjawab untuk melaksanakan Pelan Tindakan ASEAN bagi Kerjasama Tenaga. Malaysia telah dicalonkan sebagai tuan rumah untuk sesi 2019-2020 AFOC, dan Ketua Pegawai Eksekutif ST telah dilantik sebagai pengerusi AFOC.

17th ASEAN Forum on Coal (AFOC) Council Meeting
AFOC is one of the sub-sector networks and specialised energy bodies responsible for implementing the ASEAN Plan of Action for Energy Cooperation. Malaysia was nominated as the host country of AFOC's 2019-2020 session, and the Commission's Chief Executive Officer was appointed as the AFOC chair.

8-11

ST terlibat sebagai ahli panel di *Pacific Area Standards Congress* (PASC) / ISO mengenai Pengawasan Badan-badan Kawal Selia dan Piawaian di New Zealand

The Commission was involved as a panelist at the Pacific Area Standards Congress (PASC) / ISO Workshop on Regulators and Standard Bodies Stewardship held in New Zealand

11

Seminar Keselamatan Sistem Gas Berpaip
Seminar ini menyaksikan pelancaran buku panduan *Guidelines on Gas Piping System at Launderettes and Similar Installations*.

Seminar on the Safety of Piped Gas Systems
The seminar saw the launch of the publication Guidelines on Gas Piping System at Launderettes and Similar Installations.

SETAHUN YANG LALU 2019

22

Lawatan Kerja China Productivity Centre, Taiwan ke ST

Working Visit by China Productivity Centre, Taiwan to the Commission

30

ST Energy Talk: Trilema Tenaga Global - Cabaran Keselamatan Tenaga, Perlindungan Alam Sekitar dan Kecekapan Ekonomi oleh Prof. Dr. Ken Koyama di UNITEN

Energy Commission Talk: Global Energy Trilemma - Challenges for Energy Security, Environment Protection and Economic Efficiency by Prof. Dr. Ken Koyama at UNITEN

MEI MAY

28

Bengkel SWOT ST
Bengkel dalaman ini dijalankan untuk mengumpul maklumat bagi pembangunan Pelan Perniagaan ST 2020-2024.

ST SWOT Workshop
This internal workshop was held to gather inputs for the development of the Commission's Business Plan 2020-2024.

JUN JUNE

18

Hari Terbuka ECOS Awareness, Kawasan Utara
Program yang diadakan di Pejabat Kawasan Pulau Pinang, Kedah dan Perlis ini bertujuan untuk menggalakkan penggiat industri dan pelanggan untuk mendaftar dengan ST bagi permohonan dan pembaharuan lesen. Program ini telah menyaksikan lebih daripada 100 penyertaan.

ECOS Awareness Open Day, Northern Region
The event, held at the Pulau Pinang, Kedah and Perlis Regional Ofiice, was to encourage industry players and customers to register with the Commission for applications and renewals of licences. It saw more than 100 participants.

20

Majlis Hari Raya Aidilfitri ST
ST telah mengadakan majlis jamuan Hari Raya bagi kakitangan dan jemputan di ibu pejabat.

Hari Raya Aidilfitri Celebration
The Commission hosted the festive event for staff and guests at the head office.

JULAI JULY

10

Kunjungan Hormat oleh Energy Market Authority (EMA), Singapura

Courtesy Call by Energy Market Authority (EMA), Singapore

A YEAR THAT WAS 2019

11

Mesyuarat Panel Perundingan Tenaga Semenanjung Malaysia di Putrajaya
Perbincangan mesyuarat ialah mengenai perkara-perkara berkaitan polisi, strategi dan tenaga yang memberi kesan kepada pihak-pihak pemegang taruh di dalam industri pembekalan tenaga.

Peninsular Malaysia's Energy Consultative Panel Meeting Putrajaya
This meeting discussed policies, strategies and energy matters that affect various stakeholders in the energy supply industry.

16

***International Forum on Global Energy Landscape* (IFGE 2019): Peluang dan Cabaran dalam Peralihan Tenaga Global**
Pakar-pakar tenaga dan ahli akademik, membincangkan mengenai landskap tenaga semasa dan peralihan dunia menuju ke arah masa depan tenaga yang lebih mampan.

International Forum on Global Energy Landscape (IFGE 2019): Opportunities and Challenges in Global Energy Transition
Energy experts and academicians deliberated on the prevailing energy landscape and how the world is transitioning towards a more sustainable energy future.

OGOS
AUGUST

17

Energy Efficiency Run 2019

SEPTEMBER
SEPTEMBER

2

***ASEAN Ministers on Energy Meeting* (AMEM) ke-37 dan Mesyuarat berkaitan di Bangkok**
Pencapaian penting mesyuarat ini adalah persetujuan antara negara Lao PDR, Thailand dan Malaysia yang telah ditandatangani untuk menambah jumlah penjualan kuasa daripada 100MW kepada 300MW dan dihantar melalui Projek Integrasi Kuasa Lao–Thailand–Malaysia (LTM-PIP)

37th ASEAN Ministers on Energy Meeting (AMEM) and Associated Meetings in Bangkok
A significant achievement of the meeting was the signing of an agreement by Lao PDR, Thailand, and Malaysia to increase the sale of power from 100MW to 300MW, to be transferred via the Lao-Thailand-Malaysia Power Integration Project (LTM-PIP).

3-5

Minggu Utiliti Asia 2019
ST menyertai persidangan ini yang mempromosikan inisiatif-inisiatif kecekapan tenaga, keselamatan elektrik dan gas serta perkembangan Tenaga Boleh Baharu (TBB), khususnya Solar Berskala Besar (LSS).

Asian Utility Week 2019
The Commission participated in this event that promotes initiatives relating to energy efficiency, electrical and gas safety, and Renewable Energy (RE) development, in particular, Large Scale Solar (LSS).

SETAHUN YANG LALU 2019

12

Bengkel Penambahbaikan NEDA, Putrajaya
Bengkel ini menyaksikan perkongsian hasil dan cadangan daripada *NEDA Viability Study* dengan pihak industri, dan pencarian cadangan-cadangan baharu bagi *Guidelines for NEDA*. Matlamat keseluruhan bengkel adalah untuk mempromosikan NEDA dengan membangunkan set garis panduan yang dapat menarik lebih ramai peserta kepada skim ini.

Enhancement of NEDA Workshop, Putrajaya
The sharing of knowledge and recommendations of the NEDA Viability Study with industry players and new proposals were sought for the "Guidelines for NEDA" publication. The overall objective of the workshop was to promote NEDA by developing a set of guidelines that can attract more participants to this scheme.

18

Majlis Penutupan Program Touchpoint 2019 di Kimanis, Papar, Sabah

Closing Ceremony of the 2019 Touchpoint Programme in Kimanis, Papar, Sabah

9-11

***International Greentech and Eco Products Exhibition & Conference Malaysia* (IGEM) ke-10: Menginovasikan Kemampanan**
Malaysia telah menganjurkan *International Greentech and Eco Products Exhibition & Conference Malaysia* (IGEM) yang ke-10 dari 9 hingga 11 Oktober. Bertemakan "Menginovasikan Kemampanan", IGEM 2019 telah memberi tumpuan kepada inovasi-inovasi teknologi untuk membantu mengatasi masalah sumber asli yang semakin berkurangan, pelepasan gas karbon dioksida dan perubahan iklim demi masa hadapan yang lebih mampan.

Bagi menggalakkan peningkatan penyertaan dalam TBB, YB Menteri MESTECC telah membuat pengumuman untuk memperkenalkan tarif hijau iaitu myGreen+. Tarif hijau ini mengambil bentuk *rider* tarif yang memberi pilihan kepada pengguna untuk membeli kuasa yang dijana sepenuhnya daripada TBB.

Sistem Pengesanan Atribut Hijau Malaysia (MGATS) yang merupakan suatu platform nasional untuk pengesanan dan perdagangan TBB, turut dilancarkan pada persidangan tersebut. MGATS mengeluarkan sijil TBB yang boleh didagang dan bertujuan untuk memberi insentif kepada pelabur asing dan tempatan untuk meningkatkan penyertaan dalam ekonomi hijau negara

10th International Greentech and Eco Products Exhibition & Conference Malaysia (IGEM 2019): Innovating Sustainability
Malaysia hosted the 10th International Greentech & Eco Products Exhibition and Conference Malaysia (IGEM 2019) from 9 to 11 October. With the theme "Innovating Sustainability", IGEM 2019 focused on technological innovations to help combat the threat of depleting natural resources, carbon emissions and climate change for a more sustainable future.

To encourage greater participation in RE, the Minister of MESTECC announced the introduction of a green tariff called myGreen+. The green tariff will take the form of a tariff rider to give consumers the choice of buying power that is generated solely by RE.

The Malaysian Green Attribute Tracking System (MGATS), a national platform for tracking and trading RE, was also launched during the event. MGATS will issue tradable RE certificates and is aimed at incentivising local and foreign investors to participate in the country's green economy.

OKTOBER
OCTOBER

1-4

Mesyuarat ke-28 *Joint Sectoral Committee for Electrical and Electronic Equipment (JSCEEE)* dan *Information Exchange Forum* di Singapura

28th Joint Sectoral Committee for Electrical and Electronic Equipment (JSCEEE) Meeting and Information Exchange Forum in Singapore

3

Seminar Kesedaran Kualiti Kuasa, Meter Pintar dan Prestasi Tahap Perkhidmatan TNB (GSL dan MSL) di Alor Setar, Kedah

Awareness Seminar on Power Quality, Smart Meters and TNB Service Performance Levels (GSL and MSL) in Alor Setar, Kedah

A YEAR THAT WAS 2019

NOVEMBER
NOVEMBER

13

Majlis Penyampaian Hadiah *Energy Efficiency Challenge* 2019 di Putrajaya

Prize Giving Ceremony for Energy Efficiency Challenge 2019 in Putrajaya

15

Kakitangan ST Melafazkan Ikrar Bebas Rasuah

Anti-Corruption Pledge by the Commission's staff

DISEMBER
DECEMBER

10-11

Program Keterlibatan bagi Kerjasama Masa Hadapan mengenai Keselamatan Produk antara Malaysia dan Jepun di Tokyo dan Osaka
Ketua Pegawai Eksekutif ST, Abdul Razib Dawood, mengetuai delegasi ke program di atas yang diadakan di Kementerian Ekonomi, Perdagangan dan Industri Jepun (METI), di mana perbincangan mengenai kerjasama masa hadapan di antara kedua-dua negara dijalankan.

Perbincangan ini merupakan yang kelima dalam siri perbincangan dua hala antara Malaysia dan Jepun. Program keterlibatan ini adalah platform untuk bertukar maklumat dan pengetahuan yang berguna mengenai rejim-rejim keselamatan, terutama yang berkaitan dengan keselamatan produk.

Engagement Programme for Future Cooperation on Product Safety Between Malaysia and Japan in Tokyo and Osaka
The Commission's Chief Executive Officer, Abdul Razib Dawood, led a delegation to attend the abovementioned event held at Japan's Ministry of Economy, Trade and Industry (METI), where discussions were held on future collaborations between the two countries.

This is the fifth in a series of such bilateral engagements between Malaysia and Japan. These engagements are a platform to exchange valuable information and knowledge on safety regimes, especially those related to product safety.

ST menggunakan pelbagai saluran komunikasi untuk meningkatkan kesedaran awam akan perkara-perkara berkaitan dengan sektor tenaga iaitu media cetak, elektronik dan dalam talian. Sepanjang 2019, ST telah menyebarkan maklumat tentang pelbagai topik termasuklah isu keselamatan peralatan elektrik, tarif gas dan elektrik, operasi penguatkuasaan, kecekapan tenaga dan inisiatif tanggungjawab sosial korporat seperti program Touchpoint.

The Commission uses various communication channels to raise public awareness on subjects related to the energy sector. This covers print, electronic and online media. In 2019, the Commission disseminated information on various topics including electrical equipment safety issues, electricity and gas tariffs, enforcement operations, energy efficiency and corporate social responsibility initiatives such as the Touchpoint programme.

DI MEDIA

IN THE MEDIA

Peningkatan bil elektrik di luar jangkaan adalah isu yang mendesak. Untuk menangani isu ini, ST telah mengadakan sidang media yang diketuai oleh Menteri dan Timbalan Menteri MESTECC dan Pengerusi ST, Datuk Ir Ahmad Fauzi Hasan.

Sidang media ini telah mendapat liputan media pelbagai bahasa seperti BERNAMA, Kosmo, The Star, Nanyang Siang Pau, RTM, TV Al-Hijrah dan The Malaysian Reserve.

Di samping itu, ST telah mengeluarkan sebanyak 31 siaran akhbar di sepanjang tahun untuk meningkatkan kesedaran tentang penggunaan tenaga secara pintar, cekap dan selamat, serta mempromosi program-program ST.

Siaran-siaran akhbar tersebut membantu menghasilkan liputan luas mengenai topik-topik berikut:

- Penggunaan alat-alat jimat tenaga yang tidak berkesan secara meluas
- Rebat kepada pengguna elektrik yang mengalami gangguan bekalan elektrik
- Sistem pendawaian di tahfiz-tahfiz
- Kecurian elektrik
- *EE Run 2019*
- *EE Challenge 2019*

ST juga telah dijemput menghadiri temubual media, untuk memberi laporan mendalam mengenai pelbagai isu. Beberapa temubual telah mendapat liputan yang luas, termasuk yang berikut:

- TV3 (Suara Konsumer) mengenai alat-alat jimat tenaga; penutup logam di tiang elektrik
- BERNAMA Radio mengenai tenaga hijau; keselamatam elektrik di musim perayaan; dan kecekapan tenaga
- RTM mengenai Bangunan Berlian ST yang cekap tenaga
- Harian Metro mengenai keselamatan gas bagi perusahaan dobi
- TV1 (Selamat Pagi Malaysia) mengenai keselamatan elektrik di musim perayaan

Unexpected increases in electricity bills is a pressing issue. To address this, the Commission held a media conference led by the Minister and Deputy Minister of MESTECC and the Commission's Chairman, Datuk Ir Ahmad Fauzi Hasan.

The press conference received multilingual media coverage on BERNAMA, Kosmo, The Star, Nanyang Siang Pau, RTM, TV Al-Hijrah and The Malaysian Reserve.

In addition, the Commission issued 31 press releases through the year to increase the awareness of smart, efficient and safe usage of energy, as well as to promote the Commission's events.

The releases helped generate extensive coverage on the following topics:

- The widespread use of ineffective energy saving devices
- Rebates for electricity consumers who suffered power disruptions
- Wiring systems in tahfiz schools
- Electricity theft
- EE Run 2019
- EE Challenge 2019

The Commission was also invited for media interviews, to provide in-depth reports on various issues. Several interviews received a wide coverage, and included :

- TV3 *(Suara Konsumer)* on energy saving devices; metal covers on electric poles
- BERNAMA Radio on green energy; electrical safety during festive season; and energy efficiency
- RTM on the Commission's energy efficient Diamond Building
- Harian Metro on gas safety for launderettes
- TV1 *(Selamat Pagi Malaysia)* on electrical safety during the festive season

DALAM MEDIA

06 MAC/MAR

Timbalan Pengarah Unit Perancangan dan Penyelarasan Penguatkuasaan, Ir. Shafie Mohamed menjawab soalan wartawan selepas mengadakan operasi serbuan curi elektrik di beberapa premis di Kota Kinabalu.

The Deputy Director of the Enforcement Planning and Coordination Unit, Ir Shafie Mohamed, responds to media enquiries after an electricity theft raid at several premises in Kota Kinabalu.

23 APR

Timbalan Pengarah Unit Pembangunan Keselamatan Elektrik / Gas, Iffah Hannah Muluk ditemubual oleh wartawan Suara Konsumer berkenaan topik Alat Jimat Tenaga.

The Deputy Director of the Electrical / Gas Safety Development Unit, Iffah Hannah Muluk, interviewed on electricity saving devices by journalists from *Suara Konsumer.*

25 APR

Timbalan Pengarah Unit Perolehan Kapasiti RE, Ruzaida Daud ditemubual BERNAMA Radio mengenai topik Tenaga Hijau.

The Deputy Director of the RE Capacity Procurement Unit, Ruzaida Daud, interviewed by BERNAMA Radio on green energy.

31 MEI/MAY

Pengarah Jabatan Kawal Selia Keselamatan, Mohd Elmi Anas ditemubual di rancangan Selamat Pagi Malaysia yang disiarkan melalui saluran TV1, berkenaan topik Keselamatan Elektrik di Musim Perayaan.

The Director of Safety Regulation Mohd Elmi Anas, interviewed by TV1's *Selamat Pagi Malaysia* on electrical safety during the festive season.

IN THE MEDIA

01 JUL

Timbalan Pengarah Unit Kecekapan dan Pemuliharaan Tenaga, Zulkiflee Umar ditemubual oleh BERNAMA Radio mengenai topik Kecekapan Tenaga.

The Deputy Director of the Energy Efficiency and Conservation Unit, Zulkiflee Umar, interviewed by BERNAMA Radio on energy efficiency.

12 JUL

Timbalan Pengarah Unit Pentadbiran dan Pengurusan Fasiliti, Hamidah Abdul Rashid, ditemubual oleh TV1 mengenai Bangunan Berlian ST yang cekap tenaga.

The Deputy Director of the Administration and Facilities Management Unit, Hamidah Abdul Rashid, interviewed by TV1 on the Energy Commission's energy efficient Diamond Building.

16 JUL

Pengarah Jabatan Penguatkuasaan dan Operasi Kawasan ketika menjawab pertanyaan media selepas operasi serbuan curi elektrik di Mersing, Johor.

The Director of Enforcement and Regional Operations fielding media enquiries after electricity theft raid in Mersing, Johor.

13 SEP

Pegawai-pegawai ST di sidang media selepas operasi serbuan curi elektrik di Labuan.

ST officers at a press conference after an electricity theft raid in Labuan.

26 NOV

Pemeriksaan persediaan bagi menghadapi banjir di sebuah sekolah di Kelantan.

The inspection of flood preparations in a school in Kelantan.

BAB 01
CHAPTER 01

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Bekalan tenaga yang berdaya harap adalah amat penting bagi sesebuah negara, dan ianya bergantung kepada pelbagai pihak pemegang taruh yang berkaitan dalam rantaian bekalan bagi memastikan daya harap bekalan tenaga dan kualiti perkhidmatan industri adalah terjamin dengan gangguan bekalan tenaga yang minimum kepada pengguna.

A reliable energy supply is crucial to the nation and it is contingent upon the various stakeholders in the supply chain to ensure the reliability and quality of power supply and industry service with minimum interruption to consumers.

SOROTAN 2019
2019 HIGHLIGHTS

- Laporan Bank Dunia yang bertajuk *"Ease of Doing Business 2020"* telah menempatkan Malaysia sebagai negara yang keempat terbaik di dunia untuk "Mendapatkan Bekalan Elektrik", daripada penilaian yang telah dijalankan terhadap 190 ekonomi.
- Dua stesen janakuasa telah ditambah di Pantai Timur Sabah iaitu GT Melawa (18MW) dan Tawau Power Plant (13MW) yang telah direhabilitasi.
- *Delivery Point Unreliability Index* (DePUI), yang mengukur daya harap pemindahan kuasa dari sistem penghantaran ke sistem pengagihan, bertambahbaik di sepanjang 2019. Trend penurunan DePUI dicatatkan sebanyak 69% daripada 42.97 minit pada 2018 kepada 13.41 minit pada 2019.
- Prestasi SAIDI bagi Semenanjung Malaysia pada 2019 mencatatkan prestasi yang terbaik sejak 2011. Manakala, di Sabah pula prestasi SAIDI yang direkodkan pada 2019 merupakan yang terbaik sejak 2013. Bacaan SAIDI telah menurun kepada 48.13 minit/pelanggan/tahun di Semenanjung dan 205.31 minit/pelanggan/tahun di Sabah.
- Pada 2019, ST telah menjalankan Soalselidik Kepuasan Pelanggan dalam talian berkenaan kualiti perkhidmatan yang diberikan oleh pembekal utiliti, TNB di Semenanjung Malaysia yang telah mendapat sebanyak 2,293 maklumbalas. Hasil daripada soalselidik tersebut menunjukkan bahawa gangguan bekalan elektrik adalah antara perkara yang mendapat perhatian yang tertinggi di kalangan pelanggan TNB. Hasil daripada soalselidik ini dikongsikan bersama pembekal utiliti untuk tindakan yang sewajarnya.
- Pada 2019, rebat berjumlah RM301,091 telah dibayar kepada pelanggan dan pihak TNB telah dikenakan kompaun bernilai RM3.6 juta akibat daripada kegagalan TNB untuk memenuhi Tahap Perkhidmatan Yang Dijamin (GSL) dan Tahap Perkhidmatan Minimum (MSL) yang telah ditetapkan oleh ST.

- The World Bank's "Ease of Doing Business Report 2020" ranked "Getting Electricity" in Malaysia as fourth best in the world, from among 190 economies measured.
- Two new power stations were added in the East Coast of Sabah in 2019 which are GT Melawa (18MW) and the rehabilitated Tawau Power Plant (13MW).
- The Delivery Point Unreliability Index (DePUI), which measures the reliability of power transfer from the transmission system to the distribution system, continued to improve in 2019. DePUI showed a declining trend by 69% from 42.97 minutes in 2018 to 13.41 minutes in 2019.
- The SAIDI performance for Peninsular Malaysia in 2019 was the best since 2011. While in Sabah, the SAIDI performance recorded in 2019 was the best since 2013. The SAIDI reading decreased to 48.13 minutes/customer/year in the Peninsular and to 205.31 minutes/customer/year in Sabah.
- In 2019, the Commission conducted an online Customer Satisfaction Index (CSI) survey with regards to the quality of services provided by the utility TNB in Peninsular Malaysia that garnered 2,293 respondents. Findings showed that power disruption is a primary concern among TNB customers. The findings are shared with the utility provider for appropriate actions to be taken.
- In 2019, consumer rebates amounting to RM301,091 were paid while TNB was charged a compound of RM3.6 million due to failure to meet the Guaranteed Service Levels (GSL) and Minimum Service Levels (MSL) set by the Commission.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PERMINTAAN DAN PEMBEKALAN ELEKTRIK
ELECTRICITY DEMAND AND SUPPLY

Pada 2019, bilangan penduduk di Semenanjung Malaysia dianggarkan berjumlah seramai 26 juta dan menduduki kawasan seluas 132,265 km^2 dimana 99.9% telah menerima bekalan elektrik. Tenaga elektrik dijana daripada stesen janakuasa dengan kapasiti terpasang sebanyak 26,132MW dan campuran penjanaan yang terdiri daripada arang batu (55%), gas (41%), hidro (3%) dan solar (1%). Tenaga dibekalkan kepada pengguna industri (40%), pengguna komersial (35%) dan pengguna domestik (23%) di mana 2% yang selebihnya dibekalkan bagi aktiviti perlombongan, pertanian dan lampu awam.

Pelanggan mendapat bekalan elektrik melalui grid nasional yang terdiri daripada 1,885 *circuit-km* talian atas 500kV dan 9,329 *circuit-km* talian atas 275kV; rangkaian pengagihan terdiri daripada 683,008 *circuit-km* talian atas dan bawah tanah.

Sabah merupakan negeri kedua terbesar di Malaysia, dengan bilangan penduduk seramai 3.9 juta yang menduduki kawasan seluas 73,907 km^2. Seramai 98% penduduk menerima bekalan tenaga elektrik, di mana pada 2019, Sabah mempunyai kapasiti boleh harap sebanyak 1,277MW yang dijana oleh gas (76%), diesel (12%), hidro (6%), biogas/biomas (2%) dan solar (4%). Penyaluran sambungtara daripada Sarawak juga kini sedang dikaji sebagai satu lagi sumber tenaga bagi negeri ini.

Secara keseluruhannya, permintaan elektrik terus meningkat dari tahun ke tahun, terutama sekali kerana peningkatan penduduk dan aktiviti ekonomi. Bagi memenuhi permintaan maksimum bermusim, kapasiti terpasang yang mencukupi adalah kritikal, di mana sistem-sistem penjanaan, penghantaran dan pengagihan juga harus sentiasa berada di dalam keadaan yang baik.

In 2019, Peninsular Malaysia had a population of approximately 26 million living on a land area of 132,265 km^2 that was 99.9% electrified. Electricity is generated by power plants with an installed capacity of 26,132MW and a generation mix consisting of coal (55%), gas (41%), hydro (3%) and solar (1%). Electricity is supplied to industrial consumers (40%), commercial consumers (35%) and domestic consumers (23%) whereby the remaining 2% is supplied to mining and agricultural activities and public lighting.

Electricity is transmitted to consumers via the national grid that consists of 1,885 circuit-km of 500kV overhead lines and 9,329 circuit-km of 275kV overhead lines; the distribution network consists of 683,008 circuit-km of overhead and underground lines.

Sabah is the second largest state in Malaysia, with a population of 3.9 million inhabiting a land mass of 73,907 km^2. It is 98% electrified and in 2019, Sabah had a dependable capacity of 1,277MW generated by gas (76%), diesel (12%), hydro (6%), biogas/biomass (2%) and solar (4%). Interconnection transfer from Sarawak is being studied as another source of power in the state.

Overall, electricity demand has continued to grow year-on-year, driven largely by population growth, and increased economic activity. To meet peak seasonal demand, it is critical to ensure that there is adequate installed capacity, and that the generation, transmission and distribution systems are always in robust working condition.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Penjanaan Elektrik

Permintaan dan pembekalan tenaga elektrik dipengaruhi oleh beberapa faktor seperti tarif, Tenaga Boleh Baharu (TBB), keadaan cuaca dan inisiatif bersama untuk mengurangkan penggunaan di samping meningkatkan kecekapan tenaga.

Electricity Generation

The demand and supply of electricity is influenced by factors such as tariffs, self-generation of Renewable Energy (RE), weather conditions and concerted efforts to reduce consumption and improve energy efficiency.

	2018		2019	
	Semenanjung Malaysia Peninsular Malaysia	**Sabah dan Labuan** Sabah and Labuan	**Semenanjung Malaysia** Peninsular Malaysia	**Sabah dan Labuan** Sabah and Labuan
Kapasiti Terpasang Installed Capacity	24,418MW	1,277MW	26,132MW	1,277MW
SAIDI SAIDI	48.22 minit /pelanggan/tahun minutes/customer/year	267.87 minit /pelanggan/tahun minutes/customer/year	48.13 minit /pelanggan/tahun minutes/customer/year	205.31 minit /pelanggan/tahun minutes/customer/year
Kapasiti LSS LSS Capacity	179MW	50MW	429MW	50MW
Margin Rizab Reserve Margin	32%	29%	38%	23%
Permintaan Maksimum Maximum Demand	18,338MW	955MW	18,566MW	1,001MW

SEMENANJUNG MALAYSIA

> Bekalan dan Permintaan Maksimum Tahunan

Pada 2019, jumlah penjanaan elektrik di Semenanjung Malaysia meningkat sebanyak 2.54% kepada 130,009GWj berbanding 126,790GWj pada 2018. Permintaan tertinggi sebanyak 18,566MW disebabkan oleh cuaca panas di seluruh Semenanjung telah menyebabkan penjanaan tenaga meningkat ke 391.845GWj pada 18 April.

PENINSULAR MALAYSIA

> Annual Supply and Maximum Demand

In 2019, the total electricity generation in Peninsular Malaysia increased by 2.54%, to 130,009GWh compared to 126,790GWh in 2018. Peak demand amounting to 18,566MW due to hot weather conditions across the Peninsular saw an increase to 391.845GWh in energy generation on 18 April.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

Bekalan dan Permintaan Maksimum Tahunan di Semenanjung Malaysia, 2018 dan 2019
Annual Supply and Maximum Demand in Peninsular Malaysia, 2018 and 2019

Tahun Year	Jumlah Tenaga (GWj) Total Energy (GWh)
2018	126,790
2019	130,009

Tahun Year	2018	2019
Permintaan Maximum (MW) Maximum Demand (MW)	18,338	18,566
Penjanaan Tenaga (GWj) Energy Generation (GWh)	388.524	391.845
Tarikh Date	15 Ogos 2018 15 August 2018	18 April 2019 18 April 2019
Jumlah Tenaga (GWj) Total Energy (GWh)	126,790	130,009

> Kapasiti Terpasang

Jumlah kapasiti terpasang bagi 2019 adalah 26,132MW, berbanding dengan 24,418MW pada 2018. Tahun ini telah menyaksikan penamatan operasi loji janakuasa Port Dickson Power Bhd yang berkapasiti 436.4MW pada 28 Februari 2019. Di samping itu, sistem grid menerima penambahan kapasiti dengan permulaan operasi projek Solar Berskala Besar (LSS) (250MW), Pengerang Power (200MW) dan satu loji janakuasa baharu iaitu Jimah East Power (2,000MW).

Sejak 2018, trend peningkatan kapasiti TBB bertambah daripada 179MW pada 2018 kepada 725MW pada 2019. Ini adalah hasil daripada permulaan operasi projek LSS (429MW) dan projek mini hidro (296MW). PeningkatanTBB juga dapat dilihat di dalam campuran kapasiti pada 2019. Malaysia juga telah menerima bekalan sambungtara penghantaran pertama sebanyak 100MW daripada Lao PDR, melalui grid sambungtara Lao-Thai-Malaysia (LTM), yang merupakan sebahagian daripada *ASEAN Power Grid*.

> Installed Capacity

Total installed capacity in 2019 was 26,132MW, compared to 24,418MW in 2018. The year saw the decommissioning of the power plant owned by Port Dickson Power Bhd with a capacity of 436.4MW on 28 February 2019. In the meantime, additional capacity was added into the grid system with the commissioning of Large Scale Solar (LSS) projects (250MW), Pengerang Power (200MW) and a new power plant, Jimah East Power (2,000MW).

Since 2018, the trend saw an increase in RE capacity, which grew from 179MW in 2018 to 725MW in 2019. This is the result of the commencement of operations of LSS projects (429MW) and mini hydro projects (296MW). This represents a growth of RE in the capacity mix in 2019. Malaysia also received an inter-connection supply with the first power transfer of 100MW from Lao PDR, via the Lao-Thai-Malaysia (LTM) Interconnection grid that is part of the ASEAN Power Grid.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

KAPASITI TERPASANG SISTEM GRID
GRID SYSTEM INSTALLED CAPACITY

2018	2019
24,418MW	**26,132MW**
- Gas (11,537MW) Gas (11,537MW)	- Gas (11,000MW) Gas (11,000MW)
- Arang Batu (10,066MW) Coal (10,066MW)	- Arang Batu (12,066MW) Coal (12,066MW)
- Hidro (2,536MW, termasuk 296MW yang dianggap sebagai hidro mini) Hydro (2,536MW, which is inclusive of 296MW that is considered as mini hydro)	- Hidro (2,240MW) Hydro (2,240MW)
- TBB (179MW)* *LSS (179MW di rangkaian penghantaran) RE (179MW)* *LSS (179MW at transmission network)	- TBB (725MW)* *LSS (429MW di rangkaian penghantaran) + Hidro Mini (296MW) RE (725MW)* *LSS (429MW at transmission network) + mini hydro (296MW)
- Sambungtara (100MW) Interconnection (100MW)	- Sambungtara (100MW) Interconnection (100MW)

> Margin Rizab

Pada 2019, margin rizab berada pada paras 38% berdasarkan permintaan maksimum tahunan pada 18,566MW (18 April 2019), iaitu mengambil kira faktor kapasiti 17% daripada 429MW LSS pada rangkaian penghantaran. Walau bagaimanapun, kapasiti sambungtara tidak dimasukkan ke dalam pengiraan margin rizab tersebut.

Pada 2019, margin rizab didapati lebih tinggi berbanding dua tahun sebelumnya. Ini disebabkan oleh penambahan kapasti baharu berikutan dengan permulaan tugas projek LSS dan stesen janakuasa. Kapasiti tambahan adalah daripada Pengerang Power di Johor dan Jimah East Power di Negeri Sembilan, dimana kedua-duanya menyumbang sebanyak 2,200MW kepada sistem.

Permulaan operasi kapasiti sebanyak 200MW di Pengerang Power pada 1 Januari 2019 merupakan penambahan kapasiti kepada 400MW yang sedia ada di sistem tersebut setakat Oktober 2017. Jimah East Power U1 telah bermula operasi pada 22 Ogos 2019. Sementara itu, permulaan operasi U2 telah bermula pada 27 Disember 2019.

Margin rizab bagi dua tahun terakhir adalah seperti berikut:

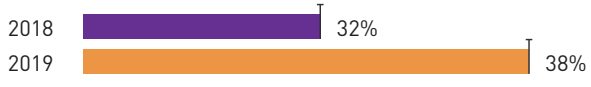
> Reserve Margin

In 2019, the reserve margin was calculated at 38% based on the maximum annual demand of 18,566MW (18 April 2019) while also taking into consideration of the 17% capacity factor from the 429MW LSS at the transmission network. However, interconnection capacity is not included in the calculation of reserve margins.

The reserve margin in 2019 was higher than in the past two years. This was due to the addition of new capacity following the commissioning of LSS and power plants during the year. Additional capacity came from Pengerang Power in Johor and Jimah East Power in Negeri Sembilan, which both contributed a combined capacity of 2,200MW to the system.

The commencement of operations for the 200MW capacity at Pengerang Power on 1 January 2019 is an additional capacity to the 400MW already in the system as of October 2017. Jimah East Power's U1 commenced operations on 22 August 2019. Meanwhile, its U2 commencement of operations occurred on 27 December 2019.

The reserve margin for the past two years is as follows:



MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

SABAH

> Bekalan Tahunan dan Permintaan Maksimum

Permintaan terus meningkat di Sabah, di mana permintaan maksimum tahunan dicatatkan pada 1,001MW bagi 2019, iaitu peningkatan sebanyak 4.8% berbanding pada 2018. Kebanyakan permintaan baharu adalah daripada sektor komersial.

Permintaan tertinggi sebanyak 1,001MW disebabkan oleh cuaca panas di seluruh Sabah telah menyebabkan penjanaan tenaga meningkat kepada 20.708GWj pada 15 Mei.

SABAH

> Annual Supply and Maximum Demand

Demand continued to grow in Sabah, which recorded an annual maximum demand of 1,001MW in 2019, a 4.8% increase over 2018. Most of the new demand came from the commercial segment.

Peak demand amounting to 1,001MW due to hot weather conditions across Sabah saw an increase to 20.708GWh in energy generation on 15 May.

2018	2019
955MW	1,001MW
10 Oktober 2018	15 Mei 2019
10 October 2018	15 May 2019

> Kapasiti Boleh Harap

Kapasiti boleh harap di Sabah kekal pada 1,277MW pada 2018 dan 2019. Stesen Janakuasa Libaran yang mula beroperasi pada pertengahan 2019, dengan kapasiti 28.8MW, telah ditamatkan pada 17 Disember 2019.

Penjanaan tenaga di Sabah terdiri daripada gas, diesel, hidro dan TBB seperti biomas dan biogas serta penjanaan daripada LSS.

> Dependable Capacity

Dependable capacity in Sabah remained unchanged at 1,277MW for 2018 and 2019. The Libaran Power Station that re-commenced operations in mid-2019, with a capacity of 28.8MW, was closed on 17 December 2019.

Energy generation in the state consists of gas, diesel, hydro and RE sources such as biomass and biogas as well as LSS generation.

KAPASITI TERPASANG SISTEM GRID
GRID SYSTEM INSTALLED CAPACITY

2018	2019
1,277MW	**1,277MW**
- Gas (968MW) Gas (968MW)	- Gas (968MW) Gas (968MW)
- Disel (150MW) Diesel (150MW)	- Disel (150MW) Diesel (150MW)
- Hidro (81MW) Hydro (81MW)	- Hidro (81MW) Hydro (81MW)
- TBB (28MW) RE (28MW)	- TBB (28MW) RE (28MW)
- LSS (50MW) LSS (50MW)	- LSS (50MW) LSS (50MW)

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

> Margin Rizab

Margin rizab di Sabah telah mencatatkan penurunan dari tahun ke tahun.

> Reserve Margin

The reserve margin in Sabah recorded a decline year-on-year.

Margin rizab sehingga hujung 2019 telah direkodkan pada 23% apabila mengalami penurunan daripada 29% pada 2018. Ini disebabkan kelewatan beberapa projek penjanaan yang pada awalnya telah dijadualkan untuk beroperasi pada tahun ini.

The reserve margin as at the end of 2019, was recorded at 23% having decreased from 29% in 2018. This was mainly due to the delays in the entry of some generation projects that were initially set for commissioning this year.

PRESTASI SISTEM PENGHANTARAN
TRANSMISSION SYSTEM PERFORMANCE

Daya Harap Sistem

Grid penghantaran adalah rangkaian yang terdiri daripada stesen janakuasa, talian penghantaran dan pencawang. Tenaga elektrik disalurkan melalui grid bervoltan tinggi - 132 kV, 275 kV dan 500 kV - bagi mencegah kehilangan tenaga yang berlaku semasa penghantaran jarak jauh.

Prestasi sistem grid dinilai melalui *Delivery Point Unreliability Index* (DePUI). Gangguan penghantaran berlaku akibat gangguan paksa (pemberhentian tidak berjadual), gangguan berjadual (sebagai langkah pencegahan dan kerja-kerja senggaraan), gangguan seketika (kehilangan bekalan voltan yang kurang daripada satu minit) dan gangguan berterusan (kehilangan bekalan voltan yang melebihi satu minit).

SEMENANJUNG MALAYSIA

Di Semenanjung, sistem penghantaran dibina, dioperasi, dan disenggara oleh TNB. ST memantau prestasi sistem penghantaran ini bagi memastikan daya harap bekalan di mana prestasi sistem berkenaan dinilai menggunakan DePUI.

Dalam tempoh lima tahun terakhir, prestasi sistem penghantaran TNB di Semenanjung Malaysia bertambah baik, dengan penurunan DePUI sebanyak 58% di antara tahun 2015 dan 2019.

Pada 2019, trend penurunan DePUI dicatatkan sebanyak 77%, kepada 0.271 minit berbanding dengan 0.348 minit pada 2018. Sepanjang tahun ini, terdapat tujuh insiden kehilangan beban yang telah dilaporkan, dengan jumlah kehilangan beban sebanyak 83.8MWj. Bilangan insiden tersebut adalah kurang berbanding tahun sebelumnya dengan 13 insiden pelantikan dan jumlah kehilangan bekalan tenaga sebanyak 174.2MWj.

Pada keseluruhannya, prestasi sistem minit bagi grid nasional masih berada pada tahap yang baik sepanjang 2019, dan insiden gangguan pemindahan bekalan tidak melebihi yang ditetapkan oleh ST, iaitu pada dua minit.

System Reliability

A transmission grid is a network of power stations, transmission lines and substations. Electricity is usually transmitted within a grid at high voltages – 132 kV, 275 kV and 500kV – to prevent energy loss that can occur during long distance transmissions.

The performance of the grid system is measured by the Delivery Point Unreliability Index (DePUI). Delivery disruptions can occur due to forced interruptions (unplanned disconnections), planned interruptions (for preventive and maintenance works), momentary interruptions (loss of supply voltage of less than one minute) and sustained interruptions (loss of supply voltage of more than one minute).

PENINSULAR MALAYSIA

In the Peninsular, the transmission system is built, operated, and maintained by national utility provider TNB. The Commission monitors the performance of the transmission system to ensure the reliability of supply, where the performance of the system is measured using the DePUI.

In the past five years, TNB's transmission system performance in Peninsular Malaysia has improved, with the DePUI declining by 58% between 2015 and 2019.

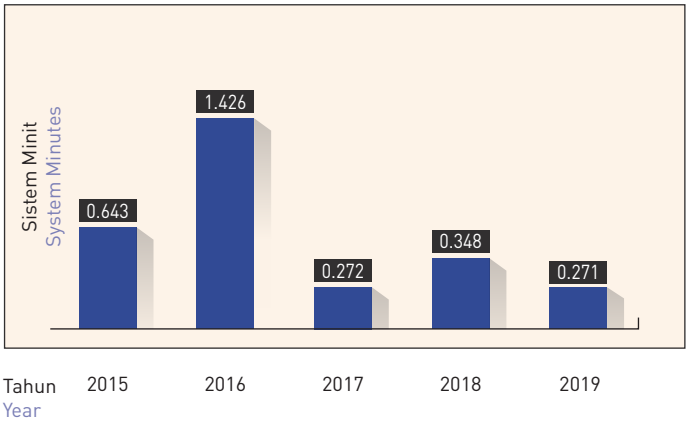
In 2019, the DePUI showed a declining trend by 77% to 0.271 minutes compared to 0.348 minutes in 2018. During the year, there were seven reported incidents of loss of load resulting in a total loss amounting to 83.8MWh. The number of such incidents has declined compared to the previous year which recorded 13 tripping incidents with a total loss of energy supply of 174.2MWh.

Overall, the national grid's minute system performance fared well in 2019, and incidents of supply transfer disruptions were within the Commission's target of two minutes.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

Carta di bawah menunjukkan penurunan DePUI bagi tempoh lima tahun terakhir, setelah memuncak pada 1.426 minit pada 2016.
The chart below shows the decline in DePUI over the past five years, after peaking at 1.426 minutes in 2016.

DePUI di Semenanjung Malaysia, 2015-2019
DePUI in Peninsular Malaysia, 2015-2019



SABAH DAN LABUAN

Di Sabah dan Labuan, sistem penghantaran dimiliki, dioperasi dan disenggara oleh Sabah Energy Sdn Bhd (SESB). Dalam tempoh lima tahun terakhir, prestasi sistem penghantaran telah menunjukkan peningkatan dengan penurunan DePUI sebanyak 86%, di mana gangguan menurun daripada 98.78 minit pada 2015 kepada 13.41 minit pada 2019.

Trend penurunan DePUI dicatatkan sebanyak 69% daripada 42.97 minit pada 2018 kepada 13.41 minit pada 2019.

Pada keseluruhannya, prestasi sistem minit bagi grid Sabah dan Labuan pada 2019 berada di tahap yang baik dan dalam sasaran yang ditetapkan ST iaitu 50 minit.

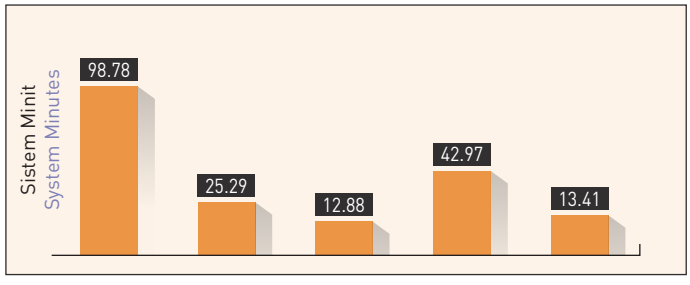
SABAH AND LABUAN

In Sabah and Labuan, the transmission system is owned, operated, and maintained by Sabah Energy Sdn Bhd (SESB). In the past five years, the performance of the transmission system has improved, with the DePUI falling by 86%, with interruptions declining from 98.78 minutes in 2015 to 13.41 minutes in 2019.

DePUI showed a declining trend by 69% from 42.97 minutes in 2018 to 13.41 minutes in 2019.

Overall, the transmission system performance of the Sabah and Labuan grid in 2019 was within the 50-minute target set by the Commission.

DePUI di Sabah, 2015-2019
DePUI in Sabah, 2015-2019



ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

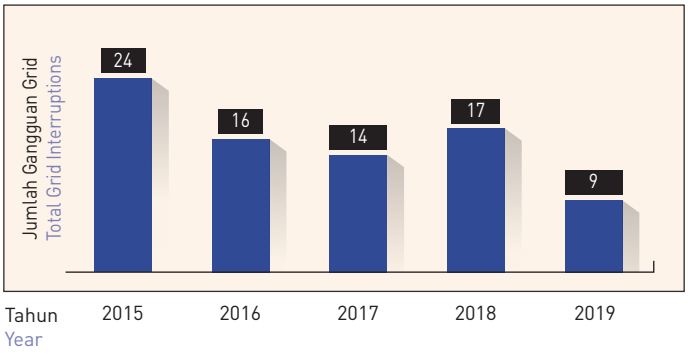
Prestasi Insiden Lucutan Beban

Pada 2019, terdapat sembilan insiden hilang beban dilaporkan pada sistem penghantaran di Sabah dan Labuan berbanding dengan 17 insiden yang dilaporkan pada 2018. Jumlah kehilangan bekalan akibat gangguan ini adalah 223.65MWj iaitu penurunan sebanyak 81% berbanding 1,178.97MWj pada 2018.

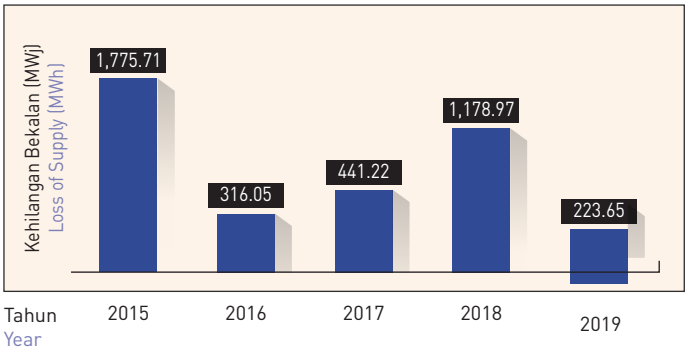
Loss of Load Incidents Performance

In 2019, there were nine reported loss of load incidents at the transmission system in Sabah and Labuan compared to 17 reported incidents in 2018. The total loss of supply from this amounted to 223.65MWh, an 81% decrease compared to the 1,178.97MWh lost recorded in 2018.

Jumlah Insiden Kehilangan Beban Berpunca daripada Gangguan Sistem Grid, 2015-2019
Total Loss of Load Incidents from Grid System Interruptions, 2015-2019



Kehilangan Bekalan, 2015-2019
Loss of Supply, 2015-2019



***Wide Area System Loss* (WASL)**

Wide Area System Loss (WASL) dalam sistem penghantaran kekal 30% daripada permintaan maksimum semasa.

Wide Area System Loss (WASL)

The Wide Area System Loss (WASL) in the transmission system remained unchanged at 30% of the current maximum demand.

PRESTASI SISTEM PENGAGIHAN
DISTRIBUTION SYSTEM PERFORMANCE

Prestasi sistem pengagihan dinilaikan melalui tiga petunjuk, iaitu, SAIDI, SAIFI dan CAIDI.

- SAIDI *(System Average Interruption Duration Index)* menghitung purata tempoh masa dalam minit setiap pelanggan mengalami gangguan bekalan dalam setahun.
- SAIFI *(System Average Interruption Frequency Index)* menghitung purata kekerapan gangguan bekalan dalam setahun.
- CAIDI *(Customer Average Interruption Duration Index)* menghitung purata tempoh masa gangguan bekalan dialami oleh pelanggan yang terlibat dalam setahun.

The performance of the distribution system is measured by three indicators, namely, SAIDI, SAIFI and CAIDI.

- SAIDI (System Average Interruption Duration Index) calculates the average duration in minutes of supply interruption per customer per year.
- SAIFI (System Average Interruption Frequency Index) calculates the average frequency of supply interruption per year.
- CAIDI (Customer Average Interruption Duration Index) calculates the average duration of supply interruption experienced by affected customers during the year.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

SEMENANJUNG MALAYSIA

Pencapaian SAIDI di Semenanjung telah menunjukkan prestasi yang baik dengan penurunan sebanyak 0.19% dengan catatan SAIDI keseluruhan sebanyak 48.13 minit/pelanggan/tahun pada 2019 (2018: 48.22 minit/pelanggan/tahun) di mana ianya masih berada di bawah sasaran SAIDI yang ditetapkan iaitu tidak melebihi 55 minit/pelanggan/tahun.

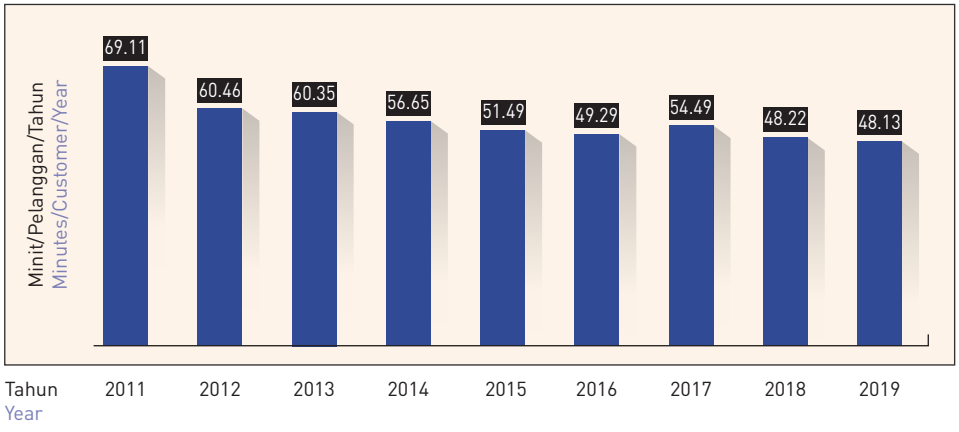
Secara keseluruhannya, Semenanjung Malaysia telah menyaksikan penurunan bagi prestasi SAIDI sebanyak 6.5% di antara 2015 dan 2019. Pada 2019, Semenanjung telah mencatatkan prestasi SAIDI yang paling rendah sejak 2011.

PENINSULAR MALAYSIA

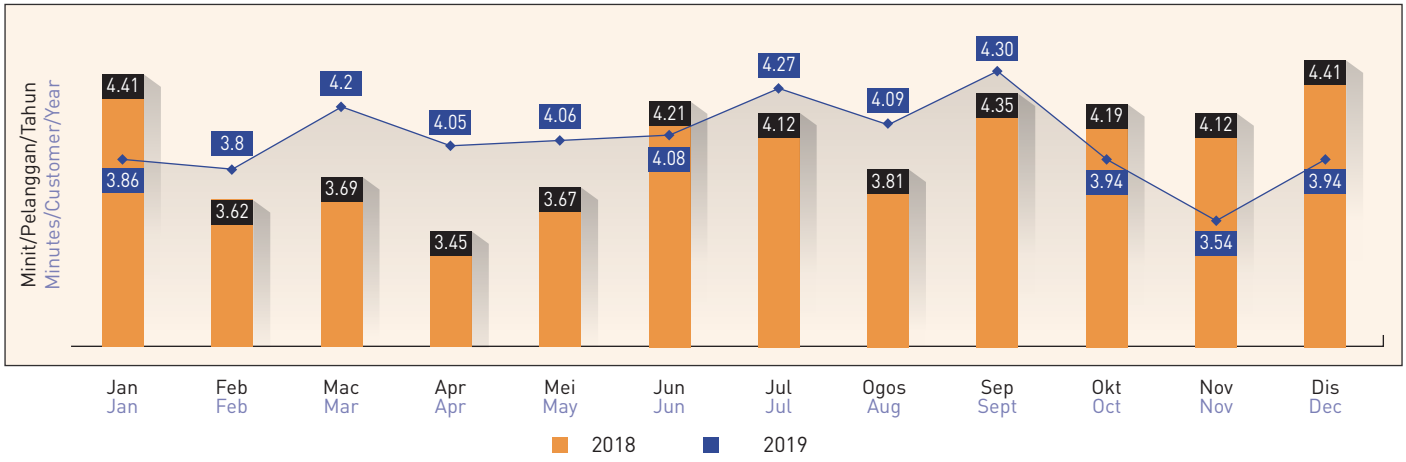
The SAIDI performance in the Peninsular showed good progress having decreased by 0.19%, recording an overall SAIDI of 48.13 minutes/customer/year in 2019 (2018: 48.22 minutes/customer/year), which falls below the targeted SAIDI of 55 minutes/customer/year.

Overall, Peninsular Malaysia has witnessed its SAIDI performance declining by 6.5% between 2015 and 2019. In 2019, the Peninsular recorded the lowest SAIDI performance since 2011.

SAIDI Elektrik Tahunan di Semenanjung Malaysia, 2011 – 2019
Annual Electricity SAIDI in Peninsular Malaysia, 2011-2019



SAIDI Elektrik Bulanan di Semenanjung Malaysia, 2018 dan 2019
Monthly Electricity SAIDI in Peninsular Malaysia, 2018 and 2019



Secara keseluruhannya, prestasi SAIDI, SAIFI dan CAIDI telah bertambah baik. Ini adalah hasil daripada usaha bersama untuk memastikan grid sentiasa berada di dalam keadaan yang mantap di samping peningkatan fokus untuk meningkatkan perkhidmatan pelanggan secara menyeluruh.

Overall, SAIDI, SAIFI and CAIDI performance have improved. This can be attributed to concerted efforts in maintaining the grid in robust working condition and increased focus on improving overall customer service.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

SAIDI, SAIFI & CAIDI di Semenanjung Malaysia, 2018 dan 2019
SAIDI, SAIFI & CAIDI in Peninsular Malaysia, 2018 and 2019

Petunjuk Prestasi Performance Indicators	**Unit** Unit	**2018**	**2019**
SAIDI	Minit/Pelanggan/Tahun Minutes/Customer/Year	48.22	48.13
SAIFI	Gangguan/Pelanggan/Tahun Interruptions/Customer/Year	0.86	0.83
CAIDI	Minit Minutes	56.07	57.99

SABAH DAN LABUAN

Pada keseluruhannya, SAIDI di Sabah telah menunjukkan trend penurunan sejak tahun 2014, daripada 777.26 minit/pelanggan/tahun pada 2014 kepada 205.31 minit/pelanggan/tahun pada 2019 yang menunjukkan penurunan kadar SAIDI sebanyak 74% dalam tempoh enam tahun.

Sistem pengagihan menjadi penyumbang utama SAIDI yang tinggi sejak tahun 2015, sementara prestasi SAIDI pada peringkat sistem penjanaan dan penghantaran bertambah baik dengan ketara.

Sepanjang tempoh ini, jurang SAIDI antara ketiga-tiga sektor di Sabah telah berkurangan dengan perbezaan yang sedikit pada tahun 2019.

SABAH AND LABUAN

The overall SAIDI in Sabah has shown a declining trend since 2014, from 777.26 minutes/customer/year in 2014 to 205.31 minutes/customer/year in 2019 which represents a decrease of 74% in SAIDI rate over a period of six years.

The distribution system has been the primary contributor to the high SAIDI since 2015, while the generation and transmission systems have made substantial improvements in their SAIDI performance.

During this period, the SAIDI gap in three sectors in Sabah narrowed, with differences becoming marginal in 2019.

Pecahan SAIDI di Sabah, 2014-2019
SAIDI Breakdown in Sabah, 2014-2019

SAIDI	2014	2015	2016	2017	2018	2019
				Minit/Pelanggan/Tahun Minutes/Customer/Year		
SAIDI Penjanaan Generation SAIDI	385.74	22.31	70.95	3.70	6.46	4.29
SAIDI Penghantaran Transmission SAIDI	157.83	130.92	18.39	10.12	2.88	2.09
SAIDI Pengagihan Distribution SAIDI	233.7	226.04	221.67	227.08	258.54	198.93
Keseluruhan Overall	**777.26**	**379.26**	**311.01**	**240.90**	**267.87**	**205.31**

SAIDI mengikut Sektor, 2014-2019
SAIDI by Sector, 2014-2019

SAIDI	2014	2015	2016	2017	2018	2019
Sektor 1 Sector 1	627.75	306.35	236.56	235.55	282.78	166.20
Sektor 2 Sector 2	925.06	469.55	380.48	208.30	254.41	284.67
Sektor 3 Sector 3	996.86	418.74	436.05	148.07	302.63	297.74

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

Analisis SAIDI di Sabah

Pada 2019, pencapaian SAIDI keseluruhan di Sabah menunjukkan penurunan sebanyak 23% daripada 267.87 minit/pelanggan/tahun pada 2018 kepada 205.31 minit/pelanggan/tahun.

Pencapaian ini adalah hasil pelaksanaan pelan jangka pendek dan jangka sederhana oleh pihak Kerajaan Persekutuan dan SESB dalam usaha untuk mengurangkan gangguan bekalan. Pelbagai projek-projek pembinaan dan senggaraan di bawah Rancangan Malaysia ke-11 telah dilaksanakan menurut jadual yang ditetapkan oleh Kerajaan Persekutuan untuk meningkatkan keberterusan dan kualiti pembekalan elektrik di Sabah. Pada masa yang sama, SESB telah melaksanakan beberapa projek untuk mengurangkan ganggguan bekalan bagi tempoh jangka pendek dan jangka sederhana.

Beberapa projek ini telah dilaksanakan dan telah menyumbang dalam pengurangan gangguan voltan tinggi dan sederhana yang disebabkan oleh kerosakan kabel, ubahtika dan pokok. Di samping itu, SESB telah meningkatkan tumpuan kepada kerja-kerja senggaraan pencegahan, pembangunan rentis, *Condition Based Monitoring* bagi pencawang dan talian atas, serta *Polarity Index/Dielectric Absorption Ratio (PI/DAR)* bagi kabel bawah tanah.

Selain daripada itu, penurunan SAIDI bagi bahagian pengagihan juga telah menyumbang kepada pencapaian SAIDI yang lebih baik dari tahun ke tahun.

SAIDI Analysis in Sabah

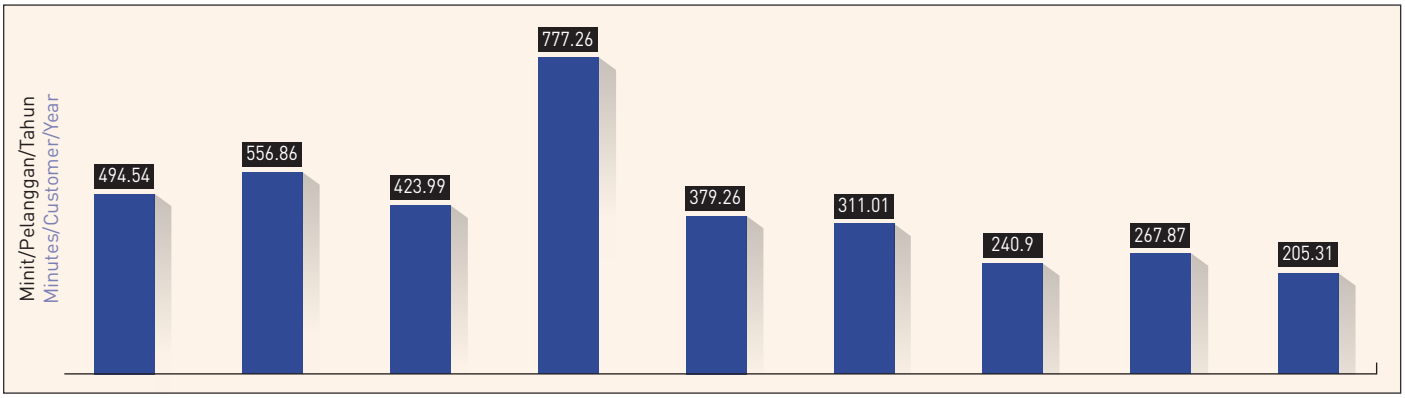
In 2019, the overall SAIDI performance in Sabah declined by 23% from 267.87 minutes/customer/year in 2018 to 205.31 minutes/customer/year.

This achievement is the result of short- and medium-term plans implemented to reduce power interruptions by the Federal Government and SESB. Various planned maintenance and construction projects implemented according to a fixed schedule were undertaken by the Federal Government to improve the overall security and quality of electricity supply in Sabah under the 11th Malaysia Plan. At the same time, SESB had several projects to reduce supply interruptions in both the short term to medium term period.

Several of these projects have been implemented and resulted in the reduction in medium and high voltage interruptions caused by damaged cables, transient faults and trees. In addition, SESB had increased its focus on preventive maintenance, the development of rentice, Condition Based Monitoring of substations and overhead lines, and Polarity Index/Dielectric Absorption Ratio (PI/DAR) for underground cables.

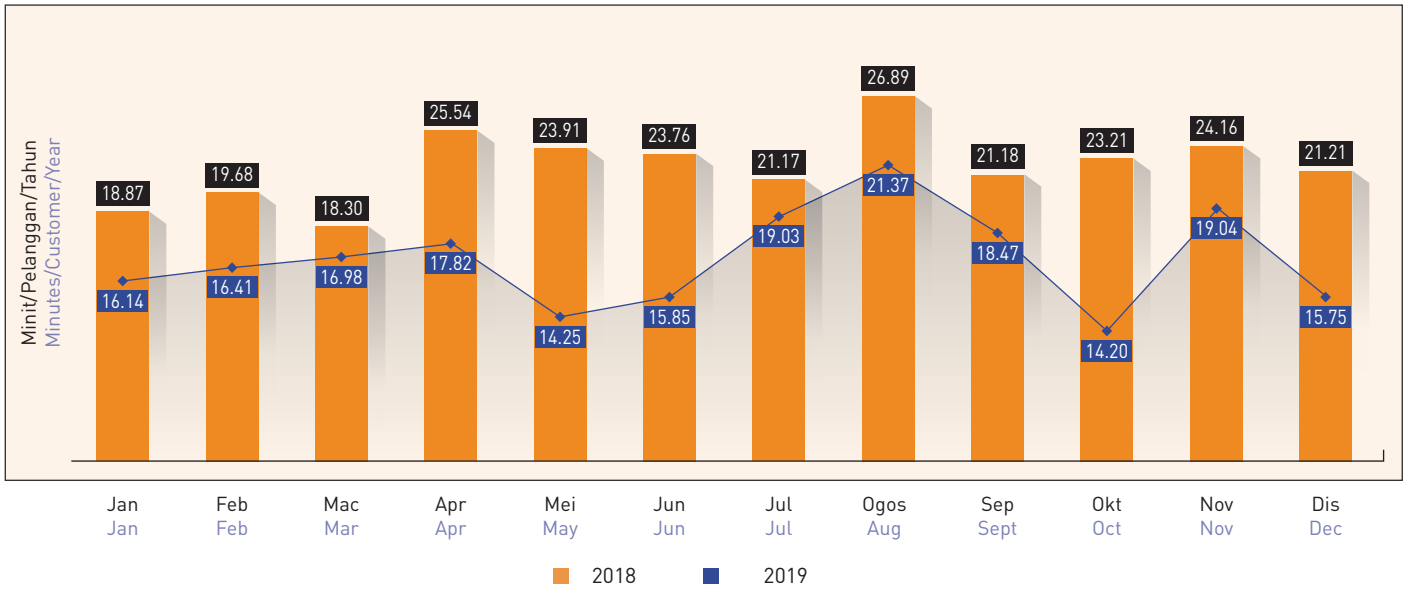
Apart from that, the reduction in SAIDI at the distribution level also contributed to the overall improvement in SAIDI from year to year.

SAIDI Elektrik Tahunan di Sabah, 2011-2019
Annual Electricity SAIDI in Sabah, 2011-2019



ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

SAIDI Elektrik Bulanan di Sabah, 2018 dan 2019
Monthly Electricity SAIDI in Sabah, 2018 and 2019



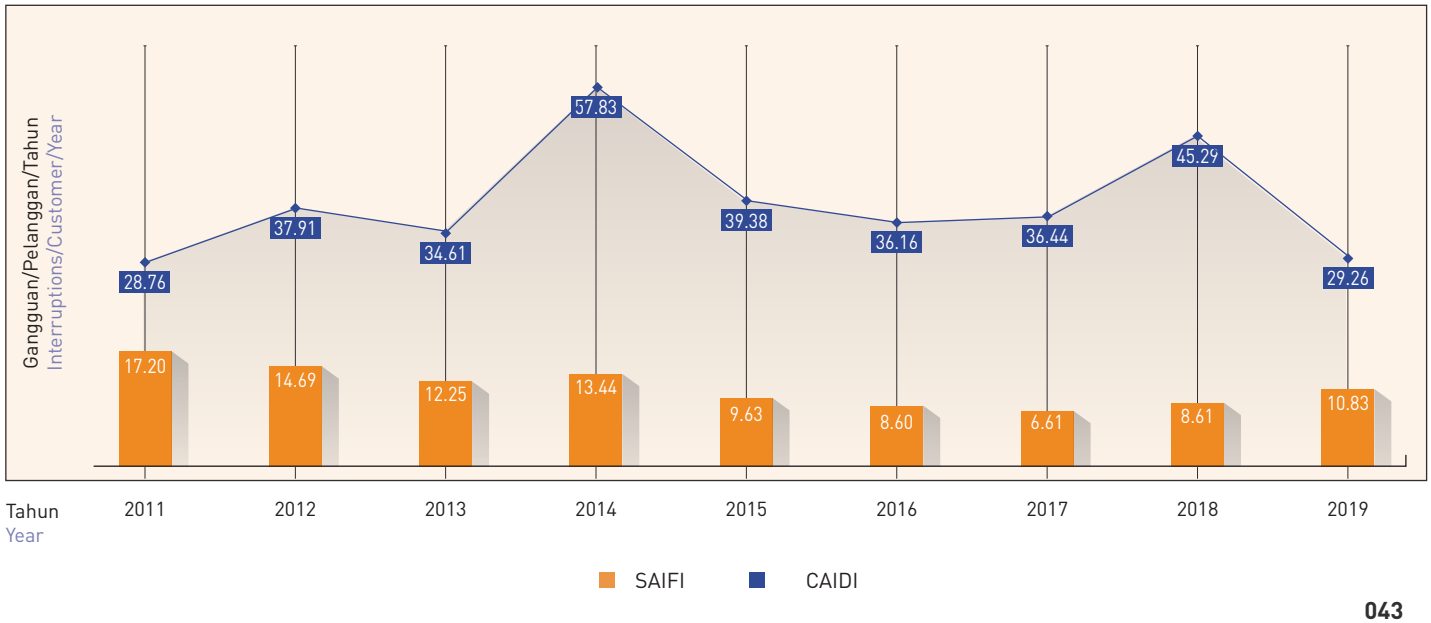
Pencapaian SAIFI dan CAIDI di Sabah

Pada 2019, kadar SAIFI telah meningkat sebanyak 20% kepada 10.83 gangguan/pelanggan/tahun (2018: 8.61 gangguan/pelanggan/tahun) disebabkan oleh kekerapan gangguan oleh kerosakan kabel dan gangguan pokok. CAIDI menunjukkan penurunan sebanyak 35% kepada 29.26 minit (2018: 45.29 minit) disebabkan oleh tindakan pantas dalam tempoh pemulihan oleh SESB.

SAIFI and CAIDI Achievements in Sabah

In 2019, the average SAIFI increased by 20% to 10.83 interruptions/customer/year (2018: 8.61 interruptions/customer/year) due to frequent interruptions mainly caused by damaged cables and trees. CAIDI declined by 35% to 29.26 minutes (2018: 45.29 minutes) due to the fast response and restoration time from SESB.

SAIFI dan CAIDI di Sabah, 2011-2019
SAIFI and CAIDI in Sabah, 2011-2019



MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PRESTASI SISTEM BEKALAN GAS BERPAIP UNTUK SEKTOR BUKAN TENAGA

Secara keseluruhannya, gangguan bekalan gas berpaip untuk sektor bukan tenaga telah menurun dari tahun ke tahun. Prestasi SAIDI telah mencatatkan penurunan sebanyak 42% daripada 0.306 minit/pelanggan/tahun pada 2018 kepada 0.178 minit/pelanggan/tahun pada 2019.

Sementara itu, prestasi SAIFI turut mencatatkan penurunan daripada 0.0008 gangguan/pelanggan/tahun pada 2018 kepada 0.0007 gangguan/pelanggan/tahun pada 2019.

Walaubagaimanapun, prestasi CAIDI telah menunjukkan peningkatan mendadak pada 2018 diikuti dengan penurunan kepada 259.56 minit pada 2019 (2018: 404.82 minit).

PIPED GAS SUPPLY SYSTEM PERFORMANCE IN THE NON-ENERGY SECTOR

Overall, interruptions in piped gas supply in the non-energy sector have declined year on year. There has been a decline in SAIDI by 42% from 0.306 minutes/customer/year in 2018 to 0.178 minutes/customer/year in 2019.

Meanwhile, the performance of SAIFI also recorded a decline from 0.0008 interruptions/customer/year in 2018 to 0.0007 interruptions/customer/year in 2019.

However, CAIDI showed a sharp increase in 2018 and declined to 259.56 minutes in 2019 (2018: 404.82 minutes).

SAIDI, SAIFI dan CAIDI bagi Sektor Bukan Tenaga, 2018 dan 2019
SAIDI, SAIFI and CAIDI for the Non-Energy Sector, 2018 and 2019

Petunjuk Prestasi Performance Indicators	2018	2019
SAIDI		
Minit/Pelanggan/Tahun Minutes/Customer/Year	0.306	0.178
SAIFI		
Gangguan/Pelanggan/Tahun Interruptions/Customer/Year	0.0008	0.0007
CAIDI		
Minit Minutes	404.82	259.56

GANGGUAN BEKALAN ELEKTRIK
ELECTRICITY SUPPLY INTERRUPTIONS

SEMENANJUNG MALAYSIA

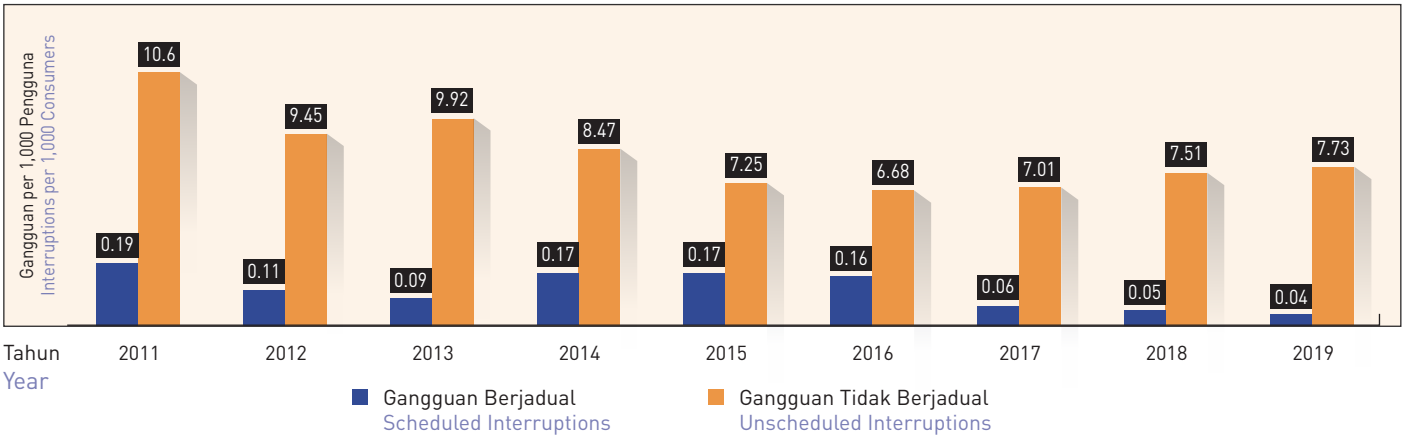
Sejak 2011, Semenanjung Malaysia mencatatkan penurunan bagi jumlah keseluruhan bilangan gangguan bekalan elektrik bagi setiap 1,000 pelanggan. Walaubagaimanapun, sedikit peningkatan dapat dilihat pada 2019 dimana sebanyak 7.73 gangguan telah dicatatkan bagi setiap 1,000 orang pelanggan berbanding dengan 7.51 pada 2018. Jumlah ini terdiri daripada 69,621 gangguan, di mana hampir kesemuanya adalah insiden voltan rendah dan sederhana yang tidak berjadual.

PENINSULAR MALAYSIA

There has been an overall decline in power interruptions per 1,000 consumers since 2011 in Peninsular Malaysia. However, 2019 saw a marginal increase in interruptions, with 7.73 interruptions recorded per 1,000 consumers compared to 7.51 in 2018. This consisted of 69,621 interruptions, nearly all being unscheduled low and medium voltage incidents.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Gangguan Bekalan Elektrik TNB Per 1,000 Pengguna, 2011-2019
TNB Electricity Supply Interruptions Per 1,000 Consumers, 2011-2019



Gangguan Bekalan mengikut Tahap Voltan pada 2019
Supply Interruptions by Voltage Level in 2019

Jenis Voltan Voltage Level	Gangguan Tidak Berjadual Unscheduled Interruptions	Gangguan Berjadual Scheduled Interruptions	Jumlah Total
Voltan Rendah Low Voltage	61,350	367	61,717
Voltan Sederhana Medium Voltage	7,895	3	7,898
Voltan Tinggi High Voltage	6	0	6
Jumlah Total	**69,251**	**370**	**69,621**

SABAH

Pada 2019, sistem pembekalan elektrik mencatatkan sebanyak 20.54 gangguan bagi setiap 1,000 pengguna (3.19 yang berjadual dan 17.35 yang tidak berjadual).

Pada keseluruhannya, terdapat 3,187 gangguan berjadual dan 17,347 gangguan tidak berjadual pada tahun berkenaan.

Gangguan Bekalan Elektrik di Sabah per 1,000 Pengguna, 2011-2019
Electricity Supply Interruptions in Sabah per 1,000 Consumers, 2011-2019

Tahun Year	Gangguan Berjadual Scheduled Interruption	Gangguan Tidak Berjadual Unscheduled Interruption
2011	4.17	50.42
2012	4.74	51.11
2013	3.70	45.90
2014	2.11	39.84
2015	1.81	33.32
2016	2.34	32.15
2017	3.46	28.85
2018	3.01	15.04
2019	3.19	17.35

SABAH

In 2019, the electricity power supply system recorded 20.54 interruptions per 1,000 consumers (3.19 scheduled and 17.35 unscheduled).

In total, there were 3,187 scheduled and 17,347 unscheduled interruptions during the year.

Jumlah Gangguan Bekalan di Sabah, 2011-2019
Total Supply Interruptions in Sabah, 2011-2019

Tahun Year	Gangguan Berjadual Scheduled Interruption	Gangguan Tidak Berjadual Unscheduled Interruption
2011	1,937	23,397
2012	2,280	24,561
2013	1,864	22,985
2014	1,145	21,594
2015	1,009	18,576
2016	1,363	18,742
2017	1,995	16,616
2018	3,012	15,041
2019	3,187	17,347

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PRESTASI KUALITI KUASA

Penanda aras antarabangsa bagi penilaian kualiti kuasa adalah SARFI (*System Average RMS Frequency Index)* yang digunakan untuk merekod bilangan kejadian junaman voltan di bawah paras yang telah ditetapkan. SARFI direkodkan dengan mengambil kira nilai peratusan voltan dan tempoh setiap kejadian junaman voltan.

Semenanjung Malaysia

Pada 2019, sebanyak 805 kejadian junaman voltan telah dicatatkan (2018: 858 kejadian). Daripada angka ini, 77.1% berada dalam *"Unaffected Region"*, di mana junaman voltan tidak mengganggu operasi pengguna jika peralatan mereka mematuhi tahap yang ditetapkan oleh piawaian MS IEC 61000-4-34. Baki 22.9% berada dalam *"Affected Region"*, di mana junaman voltan boleh menyebabkan peralatan terhenti beroperasi.

SARFI tertinggi adalah di Kelantan dan Perlis. Ini adalah berdasarkan rekod kejadian junaman voltan yang dirakam oleh 173 perakam Kualiti Kuasa yang telah dipasangkan pada sistem TNB.

Kejadian 805 junaman voltan telah melibatkan seramai 292 pengguna. Daripada jumlah ini, 621 bilangan insiden (77.1%) berada di atas paras immuniti sementara baki 184 (22.9%) berada di bawah paras immuniti. Antara negeri-negeri yang paling terjejas dari segi bilangan junaman voltan adalah Selangor (140), Perak (135) dan Johor (99). Pada keseluruhannya, sebanyak 730 aduan telah diterima manakala sebanyak 593 atau 81.2% tindakan telah diambil di lokasi-lokasi yang terlibat.

Kejadian Junaman Voltan
Voltage Sag Occurrences

2019: 805
2018: 858

POWER QUALITY PERFORMANCE

The international benchmark to measure power quality is the SARFI (System Average RMS Frequency Index). This is used to record the number of voltage sags that occur below a specified threshold. The SARFI recorded takes into account the value of the percentage of voltage and the duration of each voltage sag occurrences.

Peninsular Malaysia

In 2019, there were 805 voltage sag occurrences recorded (2018: 858 occurrences). Of this number, 77.1% were categorised as "Unaffected Region", meaning that the voltage sags did not affect the customer's operation if their equipment complies to the MS IEC 61000-4-34 standards. The remaining 22.9% were categorised as "Affected Region", where the voltage sags caused equipment to stop operating.

The highest SARFI recorded were in Kelantan and Perlis. This is based on the voltage sag occurrences record that were recorded by a total of 173 Power Quality (PQ) recorders installed on the TNB system.

The 805 voltage sag occurrences in 2019 affected 292 customers. Of this, 621 occurrences (77.1%) were above the immunity level while the remaining 184 (22.9%) were classified as below immunity level. The states most affected in terms of the amount of voltage sags were in Selangor (140), Perak (135) and Johor (99). Overall, an average of 730 complaints and action was taken at 593 or 81.2% of the affected locations.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Sistem Keseluruhan SARFI Semenanjung Malaysia pada 2019 (rangkaian 11kV, 22kV dan 33kV)
Peninsular Malaysia System-wide SARFI in 2019 (11kV, 22kV and 33kV networks)

Negeri State	**Pengguna Terlibat** Affected Customers	**Bil. Junaman Voltan** Nos. of Voltage Sags	**Sesi Penerangan kepada Pelanggan** Engagement Session with Customers			**Pemeriksaan/Perkhidmatan Kualiti Kuasa (TNB)** Power Quality Inspection/Service (TNB)		
			Aduan Complaints	**Siap** Completed	(%)	**Bil.** Nos.	**Siap** Completed	(%)
Kuala Lumpur	38	78	104	96	92.3	9	7	77.78
Putrajaya	10	25	39	34	87.2	1	0	0.00
Selangor	50	140	133	126	94.7	15	7	46.67
Johor	45	99	114	48	42.1	8	6	75.00
Melaka	25	29	91	79	86.8	5	2	40.00
Negeri Sembilan	4	62	6	3	50.0	5	1	20.00
Kelantan	-	88	-	-	-	0	0	0.00
Pahang	26	96	36	35	97.2	3	3	100.0
Terengganu	13	62	44	44	100.0	3	1	33.33
Kedah	6	80	16	7	43.8	6	1	16.67
Perak	16	135	28	12	42.9	7	1	14.29
Perlis	-	30	-	-	-	1	0	0.00
Pulau Pinang	59	44	119	109	91.6	14	2	14.29
Jumlah Total	**292**	**805**	**730**	**593**	**81.2**	**77**	**31**	**40.26**

Nota:
Tiada kejadian, aduan atau pengguna terlibat
Jumlah untuk setiap negeri tidak sama dengan jumlah keseluruhan disebabkan oleh gabungan kejadian terpecah mengikut negeri.

Notes:
No incidents, complaints or customers involved
The total for state is not the same as the overall total as combined occurrences are divided according to states.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

SARFI Terkumpul mengikut Negeri bagi Voltan Sederhana
Combined SARFI by State for Medium Voltage

Negeri State	SARFI						Bil. Alat Perakam Nos. of Recording Equipment
	90	80	70	50	40	10	
Kuala Lumpur	14.38	4.06	0.94	0.44	0.31	-	16
Putrajaya	15.60	1.80	-	-	-	-	5
Selangor	11.94	3.06	0.58	0.19	0.10	-	31
Johor	12.36	3.79	1.57	0.46	0.25	0.11	28
Melaka	7.09	4.27	2.64	0.09	0.09	-	11
Negeri Sembilan	11.64	3.09	1.55	0.36	0.09	-	11
Kelantan	32.00	6.75	2.25	0.50	0.25	-	4
Pahang	19.40	5.50	2.50	0.30	0.10	-	10
Terengganu	17.38	4.63	2.13	0.50	0.25	0.13	8
Kedah	14.71	3.29	1.79	0.14	0.07	-	14
Perak	17.83	3.61	1.22	0.39	0.33	0.06	18
Perlis	21.50	10.00	4.50	1.50	0.50	-	2
Pulau Pinang	7.60	1.13	0.53	0.13	0.13	-	15
Keseluruhan Overall	**13.73**	**3.60**	**1.38**	**0.31**	**0.18**	**0.03**	**173**

Nota:
Notes:
- *Bilangan alat perakam keseluruhan TNB adalah 173 unit*
- *There are 173 recording equipment units, TNB-wide.*
- *Jumlah ini termasuk 1 unit yang dipasang pada sistem 132kV di PMU Teluk Ewa*
- *Total includes one unit installed at the 132kV system in PMU Teluk Ewa.*

Penilaian Tahap EMC Semua Junaman Voltan
EMC Level Assessment for All Voltage Sags

Perkara Item	Bil. Nos.
Bilangan Insiden di Atas Paras Imuniti Number of Incidents Above the Immunity Level	621 (77.1%)
Bilangan Insiden di Bawah Paras Imuniti Number of Incidents Below the Immunity Level	184 (22.9%)
Jumlah Junaman Voltan Total Voltage Sag	805

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Pada 2019, sebanyak 77 Pemeriksaan dan Perkhidmatan Kualiti Kuasa telah dijalankan dimana 31 program telah selesai. Secara keseluruhannya, program tersebut melibatkan tiga tugasan iaitu *Walkthrough Investigation, Ride Through Test* (RTT) dan penyediaan laporan penuh kajian PQ yang dijalankan.

In 2019, 77 PQ Monitoring and Services were conducted whereby 31 had completed the PQ service programme. Overall, the program exercises three tasks which are a Walkthrough Investigation, a Ride Through Test (RTT) and the production of a full PQ study report.

SARFI mengikut Pengguna, 2015-2019
SARFI by Customer, 2015-2019

Tahun Year	Pengguna Terlibat Affected Customers	Bil. Junaman Voltan Nos. of Voltage Sags
2015	209	901
2016	172	923
2017	216	798
2018	365	858
2019	292	805

Punca Junaman Voltan

Punca utama junaman voltan dalam sistem penghantaran adalah kejadian sambaran kilat. Pada 2019, terdapat 76 kejadian sambaran kilat berbanding dengan 92 kejadian pada 2018. Punca lain adalah kerosakan talian atas yang disebabkan oleh isu *cross arm* dan aktiviti penggantian gentian kabel *optical ground wire* (OPGW); di mana isu-isu tersebut menjadi punca utama bagi 26 kejadian pada 2019, berbanding dengan 19 kejadian pada 2018.

Bagi sistem pengagihan, kebanyakan kejadian junaman voltan adalah disebabkan oleh punca yang tidak diketahui di mana sebanyak 116 kejadian telah dicatat pada 2019, berbanding 238 pada 2018. Punca-punca lain termasuklah kerosakan kabel, kerosakan sambungan kabel, kerosakan alat ubah dan kerosakan konduktor talian atas.

"Punca yang tidak diketahui" sering disebabkan oleh gangguan ubahtika ataupun kerosakan dalaman pada pihak pengguna.

Causes for Voltage Sags

The primary cause of voltage sags in the transmission system was lightning strikes. In 2019, there were 76 lightning strikes compared to 92 in 2018. Another cause is damaged overhead transmission lines due to cross arm issues and replacement activities of optical ground wire (OPGW) fibre cable; they accounted for 26 occurrences in 2019, compared to 19 in 2018.

In the distribution system, the majority of voltage sags were due to unknown causes. There were 116 such occurrences recorded in 2019, compared to 238 in 2018. Other causes are damaged cables and cable joints, transient faults, and damaged overhead line conductors.

'Unknown causes' usually refer to a transient or internal fault at the consumer's side.

Langkah-langkah Ke Hadapan TNB

TNB's Way Forward

1. Menggiatkan lagi usaha dan sumber untuk menyiasat kejadian-kejadian yang disebabkan oleh "punca tidak di ketahui"
   To put more effort and resources to investigate such "unknown causes"
2. Memanfaatkan program penggantian geganti mekanik lama
   To leverage on old mechanical relay replacement programme

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

Punca-punca Junaman Voltan di Semenanjung Malaysia
Causes of Voltage Sags in Peninsular Malaysia

Sistem Penghantaran
Transmission System

Punca Junaman Voltan Causes of Voltage Sags	**Bil. Kejadian** Nos. of Incidents **2018**	**2019**
Kilat Lightning	92	76
Kerosakan Talian Atas Damaged Overhead Line	19	26
Kerosakan Alat Ubah Damaged Modifier	3	3
Kerosakan Kabel Damaged Cable	8	7
Pencerobohan Trespassing	13	11
Kerosakan Busbar Damaged Busbar	4	7
Binatang Animals	3	11
Kerosakan Peralatan Suis Damaged Switches	5	2
Tidak Diketahui Unknown Causes	19	18
Stesen Janakuasa Terpelantik Tripped Power Station	0	0
Pancaran Arca Flashover	3	2
Pihak Ketiga dan Vandalisme Third Parties and Vandalism	3	2

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Sistem Pengagihan
Distribution System

Punca Junaman Voltan Causes of Voltage Sags	Bil. Kejadian Nos. of Incidents 2018	2019
Tidak Diketahui Unknown	238	116
Kerosakan Kabel Cable Fault	117	101
Kerosakan Sambungan Kabel Cable Joint Fault	123	98
Transient Fault Transient Fault	41	22
Kerosakan Konduktor Talian Atas Overhead Line Conducter Fault	35	22
Kerosakan Tamatan Kabel Cable Termination Fault	10	15
Kerosakan Peralatan Suis Switchgear Fault	8	3
Pancaran Arca Flashover	14	5
Kerosakan Sambungan Talian Atas Overhead Line Joint Fault	10	2
Pihak Ketiga dan Vandalisme Third Party and Vandalism	1	1
Korekan Pihak Ketiga Third Party Digging	6	2
Kerosakan Alat Ubah Transformer Fault	1	0
Kilat Lightning	7	2
Pencerobohan / Binatang Trespassing / Animals	0	1
Kerosakan Alat Ubah Transformer Failure	0	0
Kerosakan Busbar Busbar Fault	1	0

Aduan dan Penyelesaian Kualiti Kuasa

Pada 2019, TNB telah menerima sebanyak 730 aduan berkenaan kualiti kuasa yang kurang memuaskan akibat daripada kejadian junaman voltan, berbanding dengan 1,186 aduan pada 2018. Ini merekodkan penurunan aduan sebanyak 456 aduan.

Bagi menangani masalah kejadian junaman voltan, TNB telah melaksanakan beberapa inisiatif di lokasi serta menjalankan seminar dan dialog untuk meningkatkan pengetahuan dan pemahaman pengguna terhadap pengurusan masalah kualiti kuasa.

Power Quality Complaints and Solutions

In 2019, TNB received 730 complaints from customers regarding poor power quality due to voltage sag occurrences, compared to 1,186 complaints in 2018. This represents a decline of 456 complaints.

To address the issue of voltage sags, TNB is implementing several initiatives on the ground as well as conducting seminars and dialogues to improve consumer knowledge and their overall understanding of power quality management.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PEMBEKALAN BAHAN API
FUEL SUPPLY

SEMENANJUNG MALAYSIA

Pada 2019, arang batu kekal sebagai bahan api utama penjanaan kuasa, yang membentuk sebanyak 47% (2018: 41.5%) daripada campuran kapasiti terpasang, diikuti oleh gas asli pada 43% (2018: 47.5%) dan hidro pada 10% (2018: 11%). Berbanding dengan tahun sebelumnya, arang batu dan gas asli telah bertukar tempat di mana sebahagian besarnya adalah disebabkan oleh kos arang batu yang lebih rendah pada 2019.

PENINSULAR MALAYSIA

In 2019, coal continued to be the primary fuel for power generation, constituting 47% (2018: 41.5%) of the installed capacity mix, followed by natural gas at 43% (2018: 47.5%) with hydro making up the balance at 10% (2018: 11%). Compared with the previous year, coal and gas have traded places and this is largely due to the lower cost of coal in 2019.

Campuran Bahan Api Penjanaan di Semenanjung, 2018 dan 2019
Generation Fuel Mix in the Peninsular, 2018 and 2019

Bahan Api Fuel Type	**2018**		**2019**	
	MW	**Peratusan** Percentage	MW	**Peratusan** Percentage
Gas Gas	11,466	47.5%	10,995	43%
Arang Batu Coal	10,018	41.5%	12,081	47%
Hidro Hydro	2,655	11.0%	2,527	10%
Jumlah Total	**24,139**	**100%**	**25,603**	**100%**

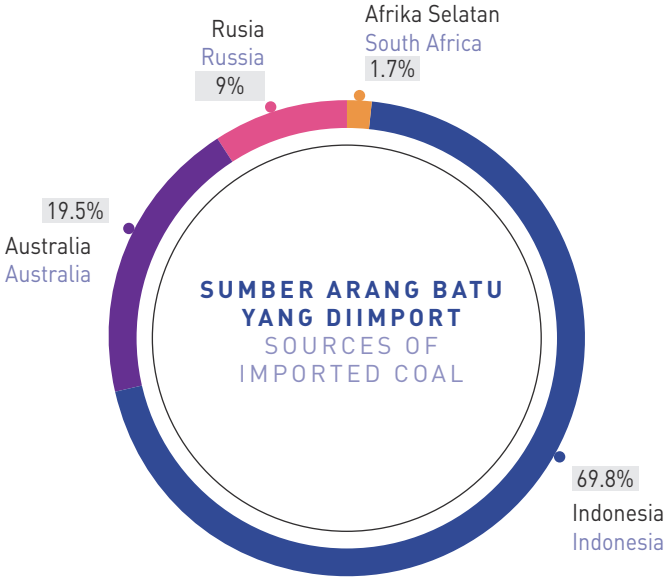
Arang Batu

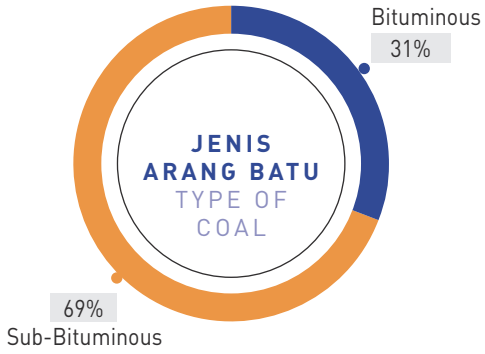
Pada 2019, sebanyak 32.65 juta tan metrik arang batu telah diimport ke dalam negara untuk tujuh buah stesen janakuasa arang batu. Indonesia merupakan pembekal terbesar, dengan bekalan sebanyak 69.8% daripada jumlah import, diikuti oleh Australia (19.5%), Rusia (9%) dan Afrika Selatan (1.7%). Arang batu jenis *sub-bituminous* membentuk 69% daripada jumlah bekalan sementara 31% daripada permintaan adalah bagi arang batu jenis *bituminous*.

Coal

In 2019, 32.65 million metric tonnes of coal were imported for seven coal-fired power stations in the country. Indonesia was the biggest supplier, accounting for 69.8% of total import, followed by Australia (19.5%), Russia (9%) and South Africa (1.7%). Sub-bituminous coal constitutes 69% of total supply while the remaining 31% of demand is for bituminous coal.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY





Gas Asli

Di Semenanjung Malaysia, gas asli dibekalkan oleh Petronas Energy & Gas Trading (PEGT). Pada 2019, jumlah bekalan adalah sekitar 2,200 mmscfd bagi sektor tenaga dan bukan tenaga. Purata penggunaan gas asli bagi sektor tenaga adalah sebanyak 1,000 mmscfd, sementara purata bagi sektor bukan tenaga adalah yang selebihnya iaitu sebanyak 1,200 mmscfd.

Secara keseluruhannya, gas yang dibekalkan oleh PEGT adalah mencukupi untuk memenuhi keperluan pengguna, terutamanya di sektor tenaga, kecuali apabila berlaku permintaan yang mendadak disebabkan oleh cuaca panas dan kejadian henti tugas yang melibatkan beberapa unit janaan berasaskan arang batu. Dalam keadaan sebegini, bahan api alternatif seperti gas akan digunakan untuk memastikan keberterusan bekalan elektrik negara.

Aktiviti senggaraan dijalankan sepanjang tahun di beberapa kemudahan gas di mana tiada gangguan bekalan gas dicatat. Bekalan gas kepada sektor tenaga diperuntukkan menurut *Allocated Quantity for Power Sector* (AQPS) seperti yang ditetapkan dalam *Gas Framework Agreement* (GFA).

Natural Gas

In Peninsular Malaysia, natural gas is supplied by Petronas Energy & Gas Trading (PEGT). In 2019, total supply was around 2,200 mmscfd for the power and non-power sectors. While the power sector consumed an average of 1,000 mmscfd, the non-power sector took up the remaining 1,200 mmscfd.

Overall, gas supplied by PEGT is adequate to cater to the needs of consumers, especially the power sector, except when there is a sudden surge in demand due to hot weather and outages at multiple coal-based generating units. In such instances, alternative fuels such as gas are used to ensure the continuity of electricity supply to the nation.

Maintenance activities were carried out throughout the year at various gas facilities and no gas supply interruption was recorded. Gas supply to the power sector is allocated according to the Allocated Quantity for Power Sector (AQPS) as per the provisions of the Gas Framework Agreement (GFA).

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PEMBEKALAN GAS ASLI DAN LPG
NATURAL GAS AND LPG SUPPLY

SEMENANJUNG MALAYSIA

Di Semenanjung Malaysia, Gas Malaysia Berhad (GMB) merupakan pembekal bagi gas asli dan Gas Petroleum Cecair (LPG).

Pada 2019, penggunaan gas asli telah meningkat kepada 200,870,596 mmBtu, berbanding 193,518,543 mmBtu pada 2018, yang menunjukkan peningkatan sebanyak 4%. LPG yang dibekalkan kepada pengguna komersial dan domestik mencatatkan penurunan dari segi permintaan pada 2019 berbanding dengan tahun 2018.

PENINSULAR MALAYSIA

In Peninsular Malaysia, Gas Malaysia Berhad (GMB) is the supplier of natural gas and Liquefied Petroleum Gas (LPG).

In 2019, the consumption of natural gas increased to 200,870,596 mmBtu, from 193,518,543 mmBtu in 2018, an increase of 4%. LPG supplied to the commercial and domestic consumers recorded a decline in demand during 2019 compared to 2018.

Penggunaan Gas Asli dan LPG (mmBtu) yang Dibekalkan oleh GMB dan SEC Mengikut Sektor, 2018 dan 2019
Natural Gas and LPG (mmBtu) Consumption Supplied by GMB and SEC by Sector, 2018 and 2019

Tahun Year		Jenis Gas Type of Gas	Domestik Domestic	Komersial Commercial	Industri Industry	Jumlah Total
2019	GMB	NG	26,488	996,089	199,848,019	200,870,596
		LPG	48,182	266,752	0	314,934
	SEC	NG	0	27,041	426,637	453,678
		LPG	0	0	0	0
2018	GMB	NG	26,100	1,017,938	192,474,505	193,518,543
		LPG	53,268	276,260	0	329,528
	SEC	NG	0	30,763	292,149	322,912
		LPG	0	0	0	0

NG: Gas Asli
Natural Gas

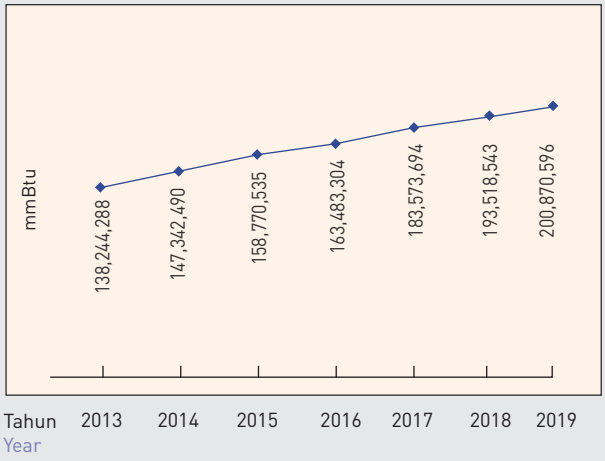
LPG: Gas Petroleum Cecair
Liquefied Petroleum Gas

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

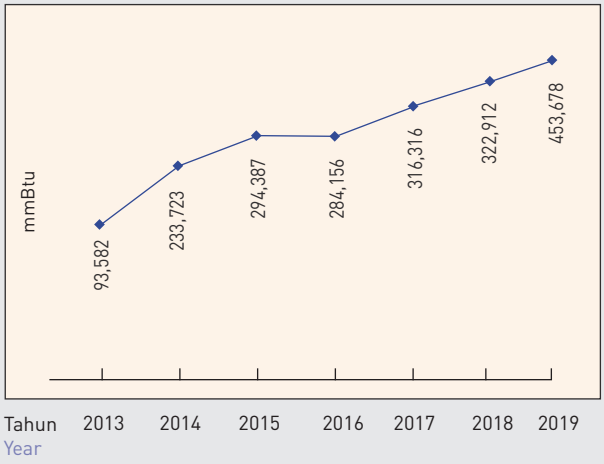
Penggunaan gas asli di Semenanjung Malaysia, Sabah dan Labuan telah meningkat sejak tahun 2013, terutamanya disebabkan oleh peningkatan dalam permintaan daripada sektor industri. Tahun ini turut menyaksikan permulaan operasi stesen Gas Asli Cecair (LNG) mikro di Sabah yang telah meningkatkan lagi permintaan gas asli di negeri tersebut.

Natural gas consumption in Peninsular Malaysia, Sabah and Labuan have been rising since 2013, mainly due to demand growth from the industrial sector. The year also saw the operation of a micro Liquefied Natural Gas (LNG) plant in Sabah that increased the demand for natural gas in the state.

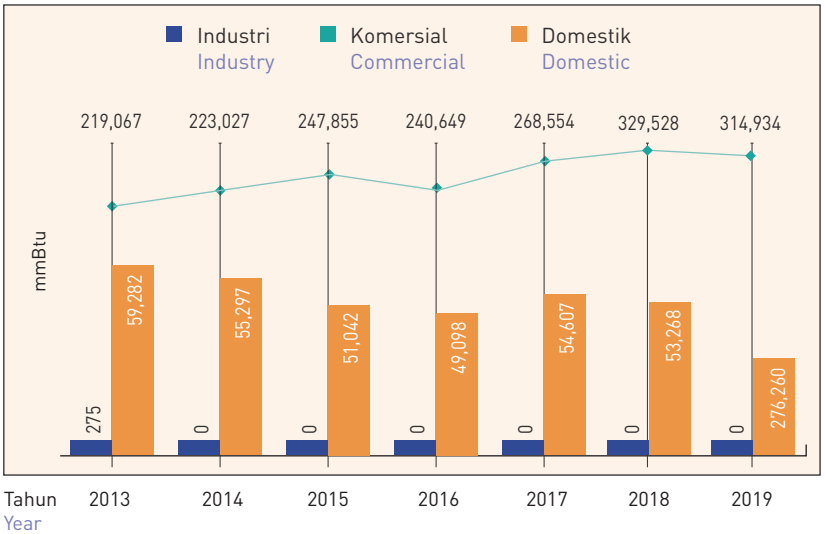
Jumlah Penggunaan Gas Asli (GMB) di Semenanjung Malaysia, 2013-2019
Natural Gas Consumption (GMB) in Peninsular Malaysia, 2013-2019



Jumlah Penggunaan Gas Asli (SEC) di Sabah, 2013-2019
Natural Gas Consumption (SEC) in Sabah, 2013-2019



Jumlah Penggunaan LPG (GMB) di Semenanjung Malaysia, 2013-2019
LPG Consumption (GMB) in Peninsular Malaysia, 2013-2019



MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PEMBANGUNAN KEMUDAHAN TALIAN PAIP GAS
DEVELOPMENT OF PIPED GAS FACILITIES

Di Semenanjung Malaysia, permintaan gas asli telah meningkat dan menyumbang kepada perkembangan dan penambahbaikan yang berterusan bagi rangkaian pengagihan gas berpaip milik GMB.

Pada 2019, talian paip gas sepanjang 2,396km yang terdiri daripada 586km paip *polyethylene* dan 1,810km paip keluli tahan karat telah dibina.

Di Sabah, talian paip gas sedang dibangunkan, di mana 10.81km gas berpaip yang terdiri daripada 6.81km paip *polyethylene* dan 4km paip keluli tahan karat telah dibina di Kota Kinabalu dan Labuan pada akhir 2019.

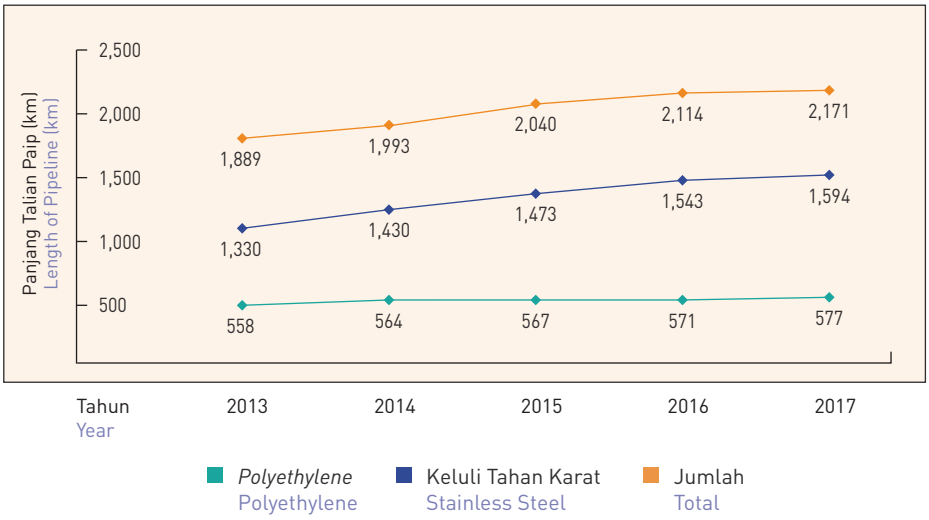
In Peninsular Malaysia, increasing demand for natural gas has seen the expansion and continuous upgrading of the piped gas distribution network by GMB.

In 2019, 2,396km of gas pipelines were laid down comprising 586km of polyethylene pipes and 1,810km of stainless-steel pipes.

In Sabah, gas pipelines are being developed, and 10.81km was laid as at the end of 2019 comprising 6.81km of polyethylene pipes and 4km of stainless steel pipes, located in Kota Kinabalu and Labuan.

Panjang Talian Paip Gas di Semenanjung Malaysia dan Sabah (km)
Length of Gas Pipelines in Peninsular Malaysia and Sabah (km)

	Semenanjung Malaysia Peninsular Malaysia		**Sabah** Sabah	
	Polyethylene Polyethylene	**Keluli Tahan Karat** Stainless Steel	***Polyethylene*** Polyethylene	**Keluli Tahan Karat** Stainless Steel
2018	426	1,68	6.78	1.30
2019	586	1,81	6.81	4.00



ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Penggunaan Gas Asli Berdasarkan Sub-Industri

Sub-industri berasaskan makanan, minuman dan tembakau terus menjadi pengguna utama gas asli bagi 2019, diikuti oleh getah dan kaca. Gas asli terus menjadi pilihan utama bagi sub-industri atas sebab harganya yang kompetitif terutamanya bagi industri yang menggunakan jumlah tenaga harian yang tinggi.

Natural Gas Consumption Based on Sub-Industry

The food, beverages and tobacco sub-industry continued to be the main consumers of natural gas in 2019, followed by the rubber and glass industries. Natural gas continued to be the preferred energy choice for these sub-industries due to its competitive price especially for industries that consume large amounts of power daily.

Penggunaan Gas Asli berdasarkan Sub-Industri di Semenanjung Malaysia pada 2019
Natural Gas Consumption based on Sub-Industry in Peninsular Malaysia in 2019

Sub-Industri Sub-Industry	**Galian Bukan Logam** Minerals	**Logam Asas** Base Metal	**Getah** Rubber	**Makanan, Minuman & Tembakau** Food, Beverages & Tobacco	**Kimia** Chemicals	**Elektrik dan Elektronik** Electrical and Electronic	**Mesin dan Peralatan** Machinery and Equipment	**Fabrikasi Logam** Metal Fabrication	**Kaca** Glass	**Lain-lain** Others
Penggunaan Consumption (mmBtu)	12,270,125	10,730,111	31,258,184	32,817,174	10,845,667	14,325,025	10,856,212	3,742,369	18,996,952	16,609,184

Bilangan pengguna gas asli di Semenanjung Malaysia kekal mendatar, iaitu pada 14,609 pada 2019 berbanding dengan 14,576 pada 2018; manakala bilangan pengguna LPG telah menurun. Ini adalah disebabkan oleh pelaksanaan Akta Bekalan Gas (Pindaan) 2016 yang bermula dari 16 Januari 2017, yang membenarkan pemilik sistem talian gas berpaip untuk memohon bagi lesen peruncitan. Di bawah pengaturan yang baharu ini, pengguna-pengguna telah dikelompokkan di bawah lesen peruncitan. Dengan itu, hanya pemegang lesen runcit sahaja yang didaftarkan sebagai pelanggan GMB, manakala, pengguna kelompok akan menjadi pelanggan pemegang lesen runcit.

The number of natural gas consumers were almost flat, at 14,609 in 2019 compared to 14,576 in 2018 in Peninsular Malaysia; whereas the number of users for LPG show a decreasing trend. This is due to the implementation of the Gas Supply (Amendment) Act 2016 from 16 January 2017, which allows owners of gas piping systems to apply for retail licences. Under this new arrangement, some consumers have been grouped under retail licences. Subsequently, only retail licensees are registered as customers of GMB, whereas, the grouped consumers will be the customers of the retail licensee.

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

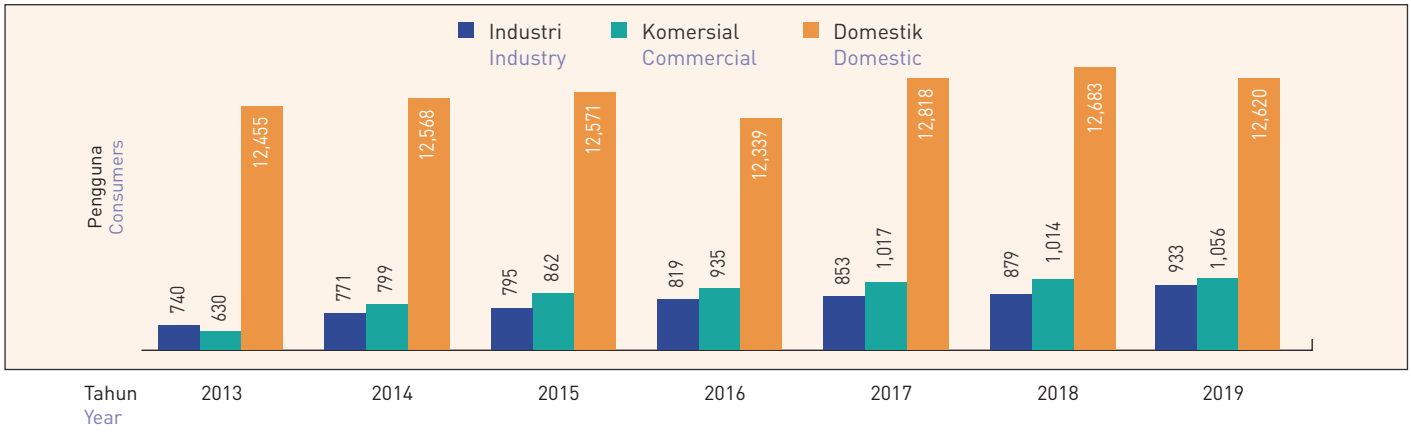
Pengguna Gas Asli dan LPG yang Dibekalkan oleh GMB dan SEC mengikut Sektor, 2018 dan 2019
Natural Gas and LPG Consumers Supplied by GMB and SEC by Sector, 2018 and 2019

Tahun Year		Jenis Gas Type of Gas	Domestik Domestic	Komersial Commercial	Industri Industry	Jumlah Total
2019	GMB	NG	12,620	1,056	933	14,609
		LPG	20,289	1,272	0	21,561
	SEC	NG	0	2	23	25
		LPG	0	0	0	0
2018	GMB	NG	12,683	1,014	879	14,576
		LPG	22,013	1,310	0	23,323
	SEC	NG	0	2	23	25
		LPG	0	0	0	0

NG: Gas Asli
Natural Gas

LPG: Gas Petroleum Cecair
Liquefied Petroleum Gas

Pengguna Gas Asli Mengikut Sektor di Semenanjung Malaysia, 2013-2019
Natural Gas Consumers by Sector in Peninsular Malaysia, 2013-2019



Namun, pengaturan ini tidak digunapakai di Sabah dan Labuan, di mana pengguna adalah daripada entiti tunggal yang menggunakan gas asli untuk keperluan sendiri sahaja.

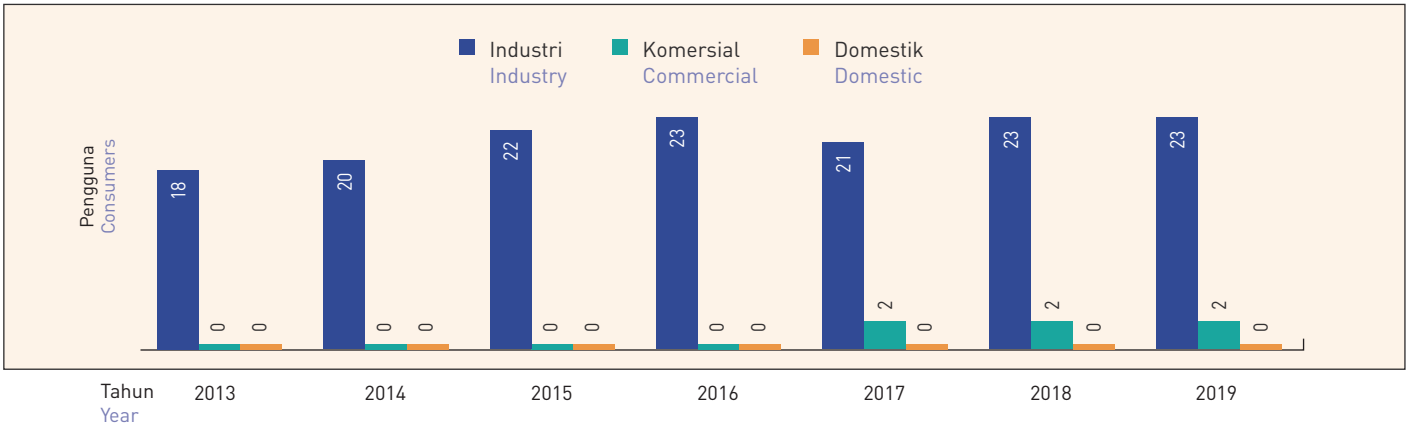
Penggunaan gas asli di Sabah terdiri daripada pengguna sektor industri sehingga tahun 2017, di mana bekalan kepada pengguna sektor komersial bermula. Jumlah pengguna gas asli kekal pada 25 pengguna sepanjang 2018 ke 2019.

This arrangement, however, is not applicable to Sabah and Labuan, where customers continue to be mostly single entities that use natural gas for their own consumption.

Natural gas consumption in Sabah was entirely made up of industrial sector consumers until 2017, when supply to commercial consumers commenced. The total number of natural gas consumers remained at 25 consumers from 2018 to 2019.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

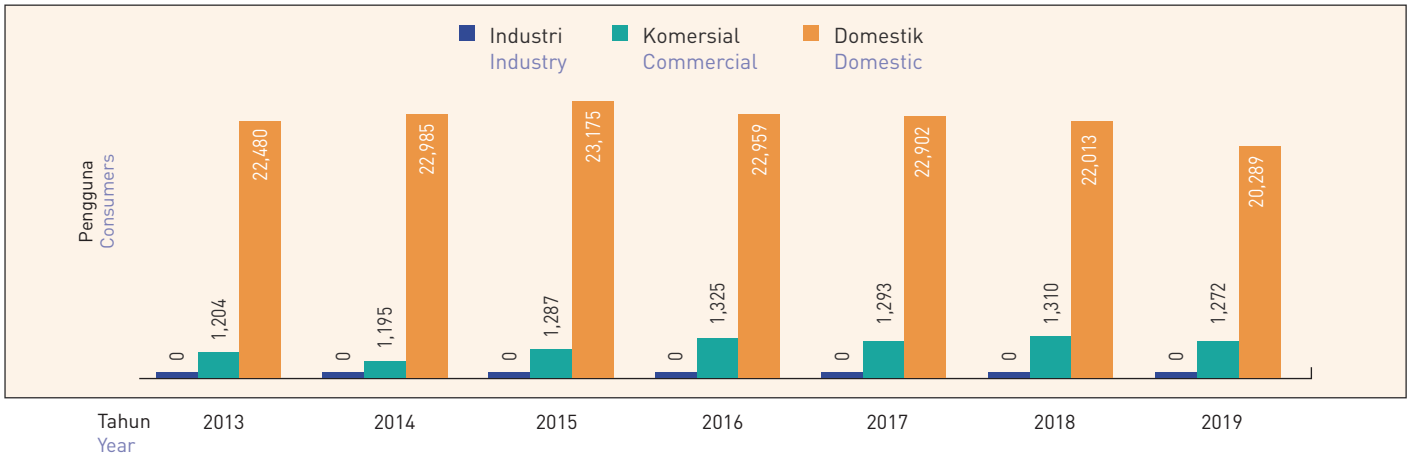
Pengguna Gas Asli di Sabah, 2013-2019
Natural Gas Consumers in Sabah, 2013-2019



Bilangan pengguna LPG daripada GMB bagi sektor domestik dan komersial di Semenanjung Malaysia telah menunjukkan penurunan sebanyak 8% pada 2019, kepada 21,561 berbanding dengan 23,323 pada 2018.

The number of GMB's LPG consumers for the domestic and commercial sectors in Peninsular Malaysia decreased by 8% in 2019, to 21,561 compared to 23,323 in 2018.

Pengguna LPG Mengikut Sektor di Semenanjung Malaysia, 2013-2019
LPG Consumers by Sector in Peninsular Malaysia, 2013-2019



MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

PRESTASI KUALITI PERKHIDMATAN INDUSTRI
INDUSTRY SERVICE QUALITY PERFORMANCE

PEMATUHAN KEPADA TAHAP PERKHIDMATAN YANG DIJAMIN (GSL) DAN TAHAP PERKHIDMATAN MINIMUM (MSL)

ST telah menetapkan piawaian prestasi yang perlu dipatuhi oleh pembekal utiliti TNB yang selari dengan syarat pelesenannya. Ianya merangkumi skop perkhidmatan seperti keberterusan bekalan, kualiti bekalan dan penyediaan bekalan (sambungan).

ST mengukur pembekalan elektrik dan perkhidmatan TNB dengan menggunakan:

- Tahap Perkhidmatan yang Dijamin (GSL) di mana TNB perlu membayar penalti kepada pengguna dalam bentuk rebat dalam bil elektrik sekiranya TNB gagal mematuhi tahap prestasi yang telah ditetapkan.
- Tahap Perkhidmatan Minimum (MSL) menetapkan tahap perkhidmatan minimum yang perlu dipatuhi oleh TNB sepanjang tempoh memberi perkhidmatan kepada pengguna. Ianya berfungsi sebagai penilaian kecekapan perkhidmatan TNB mengikut tanggungjawab statutorinya untuk membekalkan elektrik di bawah Akta Bekalan Elektrik 1990.

Pada 2019, rebat yang berjumlah sebanyak RM301,090.95 telah dibayar kepada 33,352 pengguna kuasa biasa seperti kediaman dan premis komersial kecil dan kepada 220 pengguna kuasa besar.

Sebahagian besar daripada pembayaran rebat tersebut berpunca daripada kelewatan dalam pemulihan bekalan elektrik berikutan gangguan yang disebabkan oleh kerosakan kecil pada rangkaian pengagihan (GSL 2). Pada keseluruhannya, prestasi GSL dan MSL TNB telah meningkat bagi tahun 2019. Pematuhan kepada GSL meningkat kepada 98.66% (2018: 94.38%) dan pematuhan kepada MSL meningkat kepada 94.24% (2018: 89.36%) bagi tahun ini.

COMPLIANCE OF THE GUARANTEED SERVICE LEVELS (GSL) AND MINIMUM SERVICE LEVELS (MSL)

The Commission sets performance standards that utility provider TNB has to comply with in accordance with its licence obligations. This covers service dimensions such as the availability of supply, quality of supply and provision of supply (connections).

The Commission measures the supply of electricity and services by TNB using:

- Guaranteed Service Levels (GSL) that require TNB to compensate consumers in the form of rebates in electricity bills if TNB fails to comply with the performance levels set.
- Minimum Service Levels (MSL) stipulates minimum levels of service that TNB needs to adhere to when delivering services to consumers. This serves as a measurement of the efficiency of TNB's services in accordance with its statutory duty to supply electricity under the Electricity Supply Act 1990.

In 2019, rebates amounting to RM301,090.95 were paid to 33,352 ordinary power consumers (OPC) such as households and small commercial premises and to 220 large power consumers (LPC).

The rebates were largely due to delays in restoring electricity supply following an outage caused by a minor distribution network fault (GSL 2). Overall, TNB's GSL and MSL performance improved in 2019. GSL compliance improved to 98.66% (2018: 94.38%) and MSL compliance improved to 94.24% (2018: 89.36%) during the year.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

Jumlah Rebat yang telah Dikreditkan ke dalam Bil Elektrik Pengguna, 2018 dan 2019
Total Rebates Credited Into Consumer's Electricity Bills, 2018 and 2019

Tahap Perkhidmatan Service Level	**2018**	**2019**
Jumlah Rebat yang Telah Dikreditkan ke Dalam Bil Elektrik Pengguna Total Rebates Credited into Consumer's Electricity Bills	RM516,514.96	RM301,090.95
Jumlah Pengguna OPC yang Menerima Rebat Total OPC Consumers that Received Rebates	47,282 OPC	33,352 OPC
Jumlah Pengguna LPC yang Menerima Rebat Total LPC Consumers that Received Rebates	33 LPC	220 LPC

Kadar Pematuhan TNB untuk GSL dan MSL, 2018 dan 2019
TNB Compliance Rate for GSL and MSL, 2018 and 2019

Tahap Perkhidmatan Service Level	**2018**	**2019**
GSL	94.38%	98.66%
MSL	89.36%	94.24%

Jenis GSL dan Kelulusan Rebat (RM), 2018 dan 2019
Types of GSL and Rebates Approved (RM), 2018 and 2019

Tahap Perkhidmatan Service Level	**2018 Kelulusan Rebat (RM)** Rebates Approved (RM)	**2019 Kelulusan Rebat (RM)** Rebates Approved (RM)
GSL 1	0	0
GSL 2	516,314.96	276,890.95
GSL 3	0	0
GSL 4	0	0
GSL 5	200	24,200
Keseluruhan Overall	**516,514.96**	**301,090.95**

MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

Laporan Bank Dunia Menempatkan Malaysia sebagai Negara Keempat Terbaik di Dunia bagi Kemudahan Untuk Mendapatkan Bekalan Elektrik

Laporan Bank Dunia, *"Ease of Doing Business 2020"*, telah menyaksikan Malaysia menaiki tiga tangga untuk menduduki tempat yang ke-12 di antara 190 ekonomi sedunia. Penempatan ini adalah berdasarkan kepada 10 petunjuk, salah satu daripadanya adalah "Mendapatkan Bekalan Elektrik" atau *"Getting Electricity"* di mana Malaysia berada di tangga keempat yang terbaik di dunia.

Laporan *Ease of Doing Business* telah dilancarkan pada tahun 2002 bagi mengkaji dan menilai pengawalseliaan syarikat-syarikat kecil dan sederhana (SME) untuk memulakan perniagaan di sesuatu negara. Kajian ini akan menarafkan negara berdasarkan tahun ke tahun.

Laporan tahun 2020 menekankan penunjuk "Mendapatkan Bekalan Elektrik" sebagai salah satu pencapaian yang penting bagi Malaysia pada 2019.

Kajian tersebut telah menilai proses, masa dan kos yang diperlukan untuk mendapatkan bekalan elektrik tetap ke gudang yang baharu dibina. Di samping itu, daya harap bekalan dan ketelusan indeks tarif juga turut dinilai.

Malaysia berada di tangga keempat selepas Emiriah Arab Bersatu, Korea dan Hong Kong.

World Bank Report Ranks Malaysia as Fourth Best in the World for Ease of "Getting Electricity"

The World Bank's "Ease of Doing Business 2020" report saw Malaysia moving up three places to rank 12th place among 190 economies in the world. The ranking was based on 10 indicators, one of them being "Getting Electricity" in which Malaysia ranked fourth best in the world.

The Ease of Doing Business report was launched in 2002 to study and measure regulations for small and medium companies (SMEs) to start a business in a country. The study ranks countries on a yearly basis.

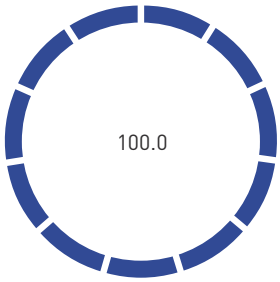
The 2020 report highlighted the "Getting Electricity" indicator as one of the significant achievements of Malaysia in 2019.

The study measured the process, time and cost required to obtain fixed electricity supply to newly built warehouses. In addition, the reliability of supply and transparency of the tariff index was also measured.

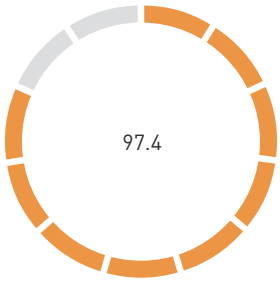
Malaysia's fourth ranking came after the United Arab Emirates, Korea and Hong Kong.

Sambungan Biasa
Standard Connection

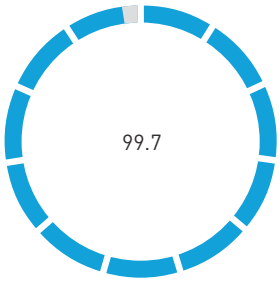
Skor Mendapatkan Bekalan Elektrik di Malaysia
The Score for Getting Electricity in Malaysia



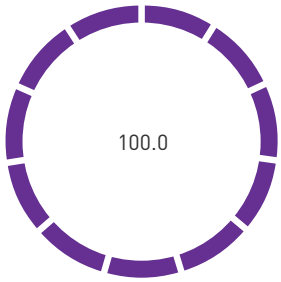
Prosedur
Procedures



Masa
Time



Kos
Cost



Daya harap bekalan elektrik dan ketelusan indeks tarif
Reliability of electricity supply and transparency of tariff index

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

PENGURUSAN ADUAN
MANAGEMENT OF COMPLAINTS

Peningkatan dalam jumlah bilangan aduan telah dicatatkan sejak tahun 2014. Pada 2019, jumlah bilangan aduan didapati meningkat di mana 2,950 jumlah aduan telah dicatatkan berbanding dengan 739 pada 2018, iaitu bersamaan dengan peningkatan sebanyak 299%. Sepanjang tahun ini, sebanyak 2,811 atau 95.29% bilangan aduan telah diselesaikan.

Peningkatan aduan yang ketara bagi 2019 adalah berikutan gangguan dalam sistem pengebilan TNB bagi bulan Mei yang menyebabkan segelintir pengguna mengalami masalah berkenaan kenaikan bil elektrik. Walau bagaimanapun, sistem telah berjaya dipulihkan dan kembali beroperasi seperti biasa beberapa hari kemudian dan pengguna yang terjejas telah dihubungi dan dimaklumkan tentang semakan bil elektrik mereka.

Since 2014, a growing number of complaints have been recorded. They peaked in 2019, when 2,950 complaints were recorded compared to 739 in 2018, which is equivalent to a 299% increase. During the year, a total of 2,811 or 95.29% of complaints were resolved.

The sharp rise in complaints in 2019 was caused by the interruption of the TNB billing system in May that led to high electricity bills for some consumers. The system was, however, successfully restored to normal operations a few days later and affected consumers were contacted and informed on their electricity bills verification outcome.

Lima Aduan Yang Lazim Diterima pada 2019
Five Common Complaints Filed in 2019

Bil elektrik yang tinggi High electricity bills	Kes usikan pepasangan meter Meter installations tempering	Pendawaian yang tidak mengikut piawaian Wiring not according to the set standard	Bil anggaran & pelarasan bil Estimated bills and adjustment	Pertukaran kategori tarif elektrik Change of electricity tariff category
61.15%	**4.07%**	**2.68%**	**2.61%**	**2.58%**

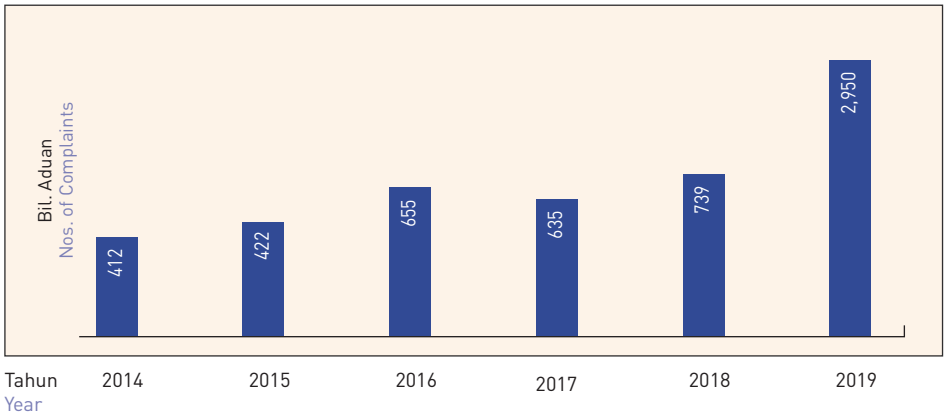
Untuk menambahbaikkan pengurusan aduan, ST telah mengambil langkah-langkah penambahbaikan seperti berikut:

- Membangunkan laman mikro eAduan
- Menerbitkan buku Panduan Pengurusan Aduan untuk rujukan pengguna
- Memperbaharui Sijil ISO 9001:2015
- Merancang pelan untuk pembangunan aplikasi mobile eAduan

In the interest of enhancing its complaints management, the Commission implemented the following improvement measures:

- Established the *eAduan* microsite
- Published the *Panduan Pengurusan Aduan* as a reference for customers
- Renewed the ISO 9001:2015 Certificate
- Developed a plan to create an *eAduan* mobile application

Aduan yang Diterima, 2014-2019
Complaints Received, 2014-2019



MEMASTIKAN DAYA HARAP BEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

INDEKS KEPUASAN PELANGGAN (CSI) TNB
CUSTOMER SATISFACTION INDEX (CSI) TNB

Pada 2019, ST telah menjalankan soalselidik Indeks Kepuasan Pelanggan ke atas pelanggan-pelanggan TNB untuk mendapatkan maklumbalas yang tepat dan telus untuk mengenalpasti tahap kepuasan mereka terhadap prestasi bekalan elektrik dan perkhidmatan yang diberikan oleh TNB. Soalselidik ini telah ditujukan kepada pelanggan TNB daripada kategori domestik, industri dan komersial.

Soalselidik tersebut terdiri daripada soalan-soalan yang merangkumi aspek perkhidmatan dan kualiti bekalan seperti berikut:

In 2019, the Commission conducted a Customer Satisfaction Index survey of TNB customers to gather accurate and transparent feedback of their satisfaction level with the performance of electricity supply and customer services rendered by TNB. The survey targeted TNB customers from the domestic, industrial and commercial segments.

The survey consisted of a questionnaire that covered the following services:

- Permohonan baharu untuk bekalan elektrik dan peningkatan dalam bekalan elektrik
  New applications for electricity supply and improvements in electricity supply
- Pemotongan dan penyambungan semula bekalan elektrik
  Disconnection and reconnection of electricity supply
- Pembacaan meter dan pengebilan
  Meter reading and billing
- Pengendalian aduan
  Handling of complaints
- Lampu jalan dan tiang sesalur
  Street lamps and main pillars
- Tarif dan caj
  Tariffs and charges
- Khidmat nasihat
  Advisory services
- Gangguan bekalan elektrik
  Electricity supply interruptions

Soalselidik tersebut telah dipromosikan menggunakan platform atas talian seperti laman web dan media sosial ST sehingga akhir tahun 2019. Soalselidik tersebut telah menerima sebanyak 2,293 maklumbalas daripada pelanggan-pelanggan TNB, yang terdiri daripada pelanggan domestik (2,041), pelanggan industri (63) dan pelanggan komersial (189).

Maklumbalas telah dikumpul di sepanjang tempoh November sehingga Disember 2019. Analisis maklumbalas menunjukkan bahawa purata tahap kepuasan pelanggan adalah sebanyak 88.8%. Bahagian yang mendapat perhatian yang tertinggi adalah berkaitan kekerapan gangguan bekalan elektrik, yang hanya mencapai purata kepuasan pelanggan sebanyak 2.49 daripada 4.

ST telah berkongsi hasil soalselidik ini bersama TNB, untuk membolehkan mereka melaksanakan tindakan penambahbaikan polisi dan inisiatif yang berkaitan dengan perkhidmatan pelanggan, kualiti bekalan dan penunjuk-penunjuk perkhidmtan pelanggan lain yang berkaitan. Ini akan dapat membantu meningkatkan jurang sebanyak 11.2% dari segi kualiti bekalan dan perkhidmatan TNB, iaitu hasil daripada soalselidik tersebut.

The survey was promoted on online platforms such as the Commission's website and social media pages until the end of 2019. It attracted responses from 2,293 TNB customers, made up of domestic customers (2,041), industrial customers (63) and commercial customers (189).

Feedback was gathered between November and December 2019. An analysis of the feedback showed an average customer satisfaction level of 88.8%. The area of highest concern was the frequency of interruption, which only achieved an average customer satisfaction rating of 2.49 out of 4.

The Commission shared these findings with TNB, to enable it to implement actions to further improve its policies and initiatives on customer service, supply quality and other related customer service indicators. This will help improve the 11.2% gap in terms of TNB supply and service quality as disclosed by the survey.

ENSURING RELIABILITY OF ENERGY SUPPLY AND INDUSTRY SERVICE QUALITY

METER PINTAR
SMART METERS

Pemasangan meter pintar sedang dijalankan dalam tiga fasa di Semenanjung Malaysia, seiring dengan Tempoh Regulatori Kedua (RP2) Kawal Selia Berasaskan Insentif (IBR) iaitu dari tahun 2018 hingga 2020. Sepanjang tempoh ini, TNB akan memasang sebanyak 1.5 juta meter pintar di Melaka dan Lembah Klang dengan jumlah kos sebanyak RM1.2 bilion.

Carta di bawah menggambarkan prestasi pemasangan meter pintar setakat ini berbanding dengan sasaran awal RP2. Daripada 2018 sehingga 2019, sebanyak 281,066 meter pintar telah dipasang berbanding sasaran awalnya sebanyak 740,389 unit. Dalam 2019 sahaja, sebanyak 120,677 unit telah dipasang berbanding sasaran awalnya iaitu sebanyak 580,000 unit.

Punca-punca kelewatan pemasangan adalah seperti berikut:

- Isu komunikasi yang menyebabkan kekurangan sambutan dari pelanggan untuk memasang meter pintar di kediaman mereka
- Aduan pelanggan terhadap kenaikan bil elektrik yang mengejut selepas pemasangan meter pintar
- Kekurangan pada infrastruktur meter pintar yang memerlukan TNB memasang *repeater* bagi memastikan meter pintar menghantar data penggunaan yang tepat kepada pusat pengebilan.

Isu-isu ini telah diselesaikan menjelang akhir tahun 2019. TNB merancang untuk memasang jumlah selebihnya sebanyak 760,000 unit seperti yang dijadualkan untuk tahun 2020.

Smart meter installations are being rolled out in three phases in Peninsular Malaysia, in tandem with the Second Regulatory Period (RP2) under the Incentive Based Regulation (IBR) from 2018 to 2020. During this period, TNB is to install 1.5 million smart meters in Malacca and the Klang Valley at a cost of RM1.2 billion.

The chart below shows the progress of the smart meter installation to date against the early RP2 target. From 2018 to 2019, a total of 281,066 smart meters were installed compared to the initial target of 740,389 units. In 2019 alone, 120,677 units were installed compared to the initial target of 580,000 units.

The delay in installation was due to the following reasons:

- Communication issues that resulted in a poor consumer response to the installation of smart meters in their homes
- Consumer complaints of sudden increases in electricity bills after the installation of smart meters
- Faults in smart meter infrastructure that required TNB to install repeaters to ensure smart meters transmit accurate consumption data to billing centres.

These issues were resolved by the end of 2019. TNB plans to install the remaining 760,000 units as scheduled in 2020.

Tahun (IBR RP2) Year (IBR RP2)	**Sasaran Pemasangan Asal** Initial Installation Target	**Sasaran Pemasangan (Disemak Semula 2019)** Installation Target (Revised 2019)	**Pemasangan Sebenar** Actual Installation
2015 Projek Perintis Pilot Project	1,000	-	800 Melaka, 200 Putrajaya
2018	240,000	160,389	160,389
2019	370,000	580,000	120,677
2020	890,000	760,000	-
Jumlah Total	**1,500,000**	**1,500,389**	**281,066**

BAB 02
CHAPTER 02

MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

ENHANCING SAFETY AND ENFORCEMENT

Suruhanjaya Tenaga (ST) telah mewujudkan pelbagai peraturan, kod keselamatan, arahan dan garis panduan bagi mencegah kemalangan elektrik dan gas serta menjaga keselamatan awam. ST memastikan semua peraturan kawal selia adalah dipatuhi, dan bila perlu, melibatkan para pemegang taruh untuk menangani isu-isu yang boleh menjejaskan piawaian keselamatan. Sebagai langkah pencegahan, pemeriksaan dan audit turut dijalankan di lokasi-lokasi berisiko tinggi kemalangan dan memastikan tindakan yang sewajarnya diambil apabila berlaku kemalangan akibat kecuaian.

The Commission has over the years enacted various regulations, safety codes, directives, and guidelines to prevent electrical and gas accidents and safeguard public safety. The Commission ensures all these regulatory compliances are met and, when needed, engages with relevant stakeholders to resolve issues related to safety. As a preventive measure, we also conduct inspections and audits at high risk accident locations, taking the necessary actions to enforce the due process when there are accidents caused by negligence.

SOROTAN 2019
2019 HIGHLIGHTS

- Tahun 2019 mencatatkan penurunan jumlah kes maut akibat kemalangan elektrik berbanding tahun 2018, namun jumlah kes tanpa maut pula telah meningkat. Talian atas bervoltan tinggi, pencawang utiliti dan premis perindustrian merupakan tiga lokasi tertinggi berlakunya kemalangan elektrik pada tahun ini.
- Dua kes kemalangan gas berpaip dicatatkan pada tahun 2019 (2018: dua kes); premis perniagaan dobi dan restoran mencatatkan bilangan kes kemalangan tertinggi akibat ketidakpatuhan kepada Akta, Peraturan dan piawaian yang telah ditetapkan dalam pepasangan.
- Daripada 60 kes yang dirujuk kepada Timbalan Pendakwa Raya, Mahkamah Sesyen telah mengenakan denda ke atas dua syarikat yang bersabit kesalahan melakukan aktiviti yang melanggar peraturan.
- ST mendapati seramai empat Orang Kompeten telah cuai ketika menjalankan tugas dan tindakan yang sewajarnya telah diambil.

- The year 2019 recorded a decline in fatal electrical accidents compared to 2018, but the number of non-fatal accidents rose. High voltage overhead lines, utility substations and industrial premises are the top three locations where electrical accidents occurred this year.
- Two piped gas accident cases were recorded in 2019 (2018: two cases); launderettes and restaurants recorded the highest number of accident cases attributed to non-compliance of the Act, Regulations and standards at installations.
- The Commission referred 60 cases to the Deputy Public Prosecutor that saw two companies being fined for non-compliant activities by the Sessions Court.
- The Commission found four Competent Persons negligent in discharging their duties, and legal action was taken.

MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

KEMALANGAN ELEKTRIK
ELECTRICAL ACCIDENTS

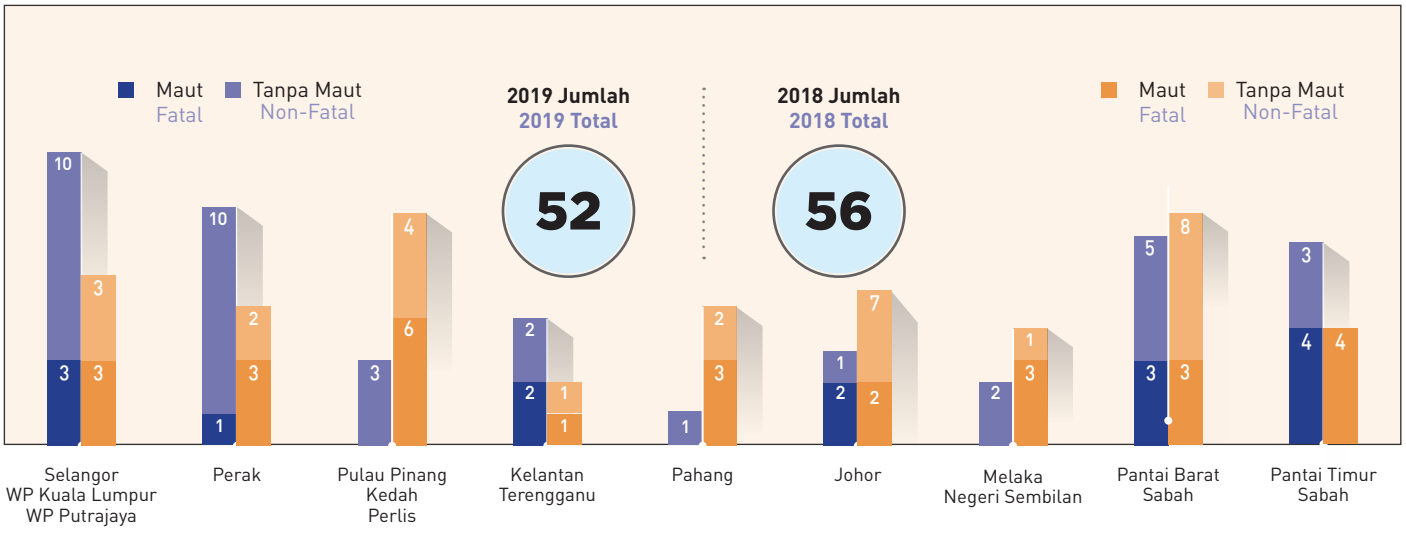
ST sentiasa mengawal selia tahap keselamatan secara berterusan di pepasangan, premis dan peralatan yang kerap berlaku kemalangan bagi mencegah kerosakan harta benda dan kehilangan nyawa akibat kemalangan elektrik.

Sejak beberapa tahun ini, kes kemalangan elektrik adalah semakin berkurangan. Sebanyak 52 kes kemalangan elektrik telah dilaporkan pada tahun 2019 berbanding dengan 56 kes pada tahun sebelumnya. Kes maut telah berkurang kepada 15 kes (2018: 28 kes) namun kes kemalangan tanpa maut telah bertambah kepada 37 kes (2018: 28 kes).

To prevent undue damage to property and lives caused by electrical accidents, the Commission continuously monitors the safety standards of accident-prone installations, premises and appliances.

Over the years, there has been a downtrend in electrical accidents. In 2019, 52 electrical accident cases were reported compared to 56 in the previous year. Fatalities declined to 15 cases (2018: 28 cases) but non-fatal accidents rose to 37 cases (2018: 28 cases).

Kemalangan Elektrik mengikut Kawasan, 2018 dan 2019
Electrical Accidents by Region, 2018 and 2019



Secara keseluruhannya, kemalangan elektrik menunjukkan penurunan dalam perbandingan kitaran lima tahun sejak 2005. Bagi tempoh 2015-2019, jumlah kes menurun sebanyak 10.85% berbanding dengan tempoh lima tahun sebelumnya (2010-2014), dan sebanyak 21.95% berbanding dengan tempoh lima tahun terawal, iaitu dari 2005-2009.

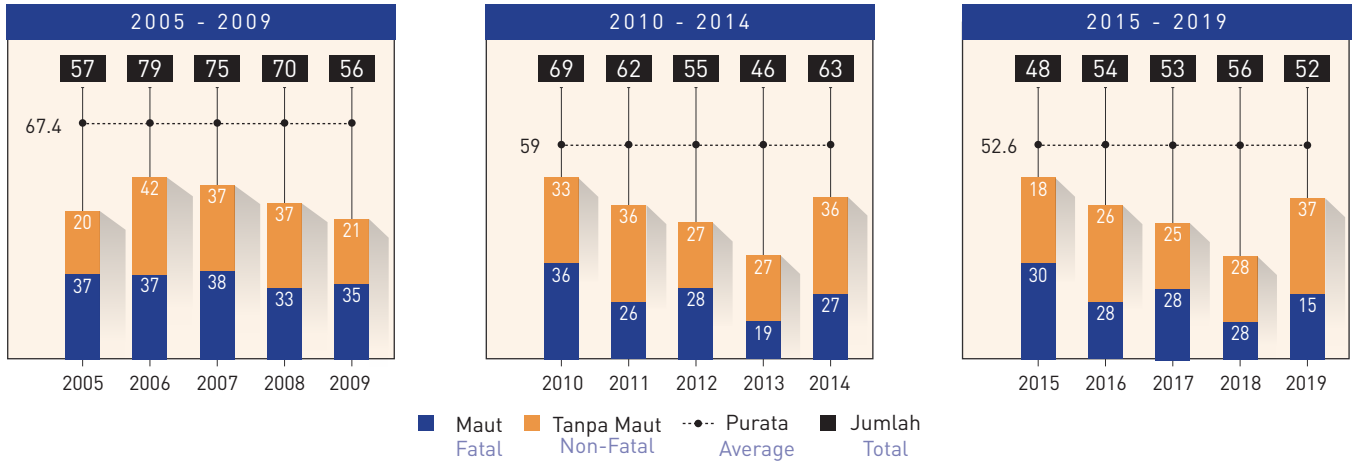
Trend penurunan dalam jumlah kemalangan elektrik adalah hasil daripada pemantauan yang lebih strategik di pepasangan elektrik yang sering berlaku kemalangan, usaha siasatan punca kemalangan secara menyeluruh serta langkah-langkah pembetulan yang diambil, dan penganjuran sesi engagement secara berterusan bersama pihak pemegang taruh yang berkenaan bagi mempertingkatkan lagi amalan pengurusan keselamatan yang baik.

Overall, electrical accident cases show a declining trend in the comparative five-year cycles since 2005. For the period 2015-2019, it decreased by 10.85%, when compared to the previous five-year cycle (2010-2014); and by as much as 21.95% when compared to the earlier five-year cycle, from 2005-2009.

The downtrend in the number of electrical accidents can be attributed to more strategic monitoring of accident-prone electrical installations, investigating more thoroughly causes of accidents and corrective measures taken, and continuous engagements with the relevant stakeholders to promote good safety management practices.

ENHANCING SAFETY AND ENFORCEMENT

Bilangan Kemalangan Elektrik: Perbandingan Tempoh 5-Tahun
Number of Electrical Accidents: Comparative 5-Year Cycle



Kadar Kemalangan Elektrik Mengikut Populasi

Jumlah penduduk di Semenanjung Malaysia dan Sabah telah mencatatkan kadar penambahan sebanyak 27.6% dalam tempoh 15 tahun ini (2005 ke 2019). Jika dibandingkan, jumlah kadar kemalangan elektrik setiap sejuta penduduk telah menurun secara konsisten.

Kadar kes kemalangan elektrik setiap sejuta penduduk bagi tempoh semasa iaitu 2015 ke 2019 telah menurun sebanyak 18% berbanding dengan tempoh 5 tahun sebelumnya, iaitu dari 2010 ke 2014. Terdapat pengurangan kumulatif bilangan kemalangan elektrik bagi setiap sejuta penduduk sejak 2005, iaitu sebanyak 34.8%.

Secara keseluruhannya, kadar purata kemalangan setiap sejuta penduduk telah menurun daripada 2.79% (2005-2009) kepada 2.22% (2010-2014) dan seterusnya kepada 1.82% (2015-2019).

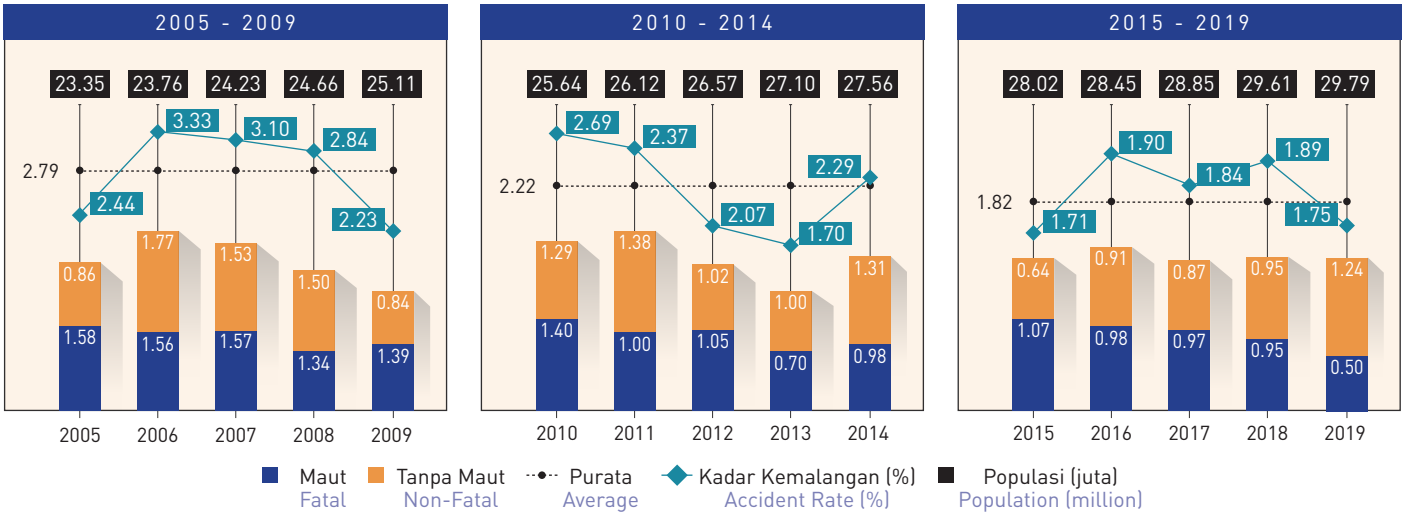
Electrical Accident Rate by Population

In the past 15 years (2005 to 2019), Peninsular Malaysia and Sabah have recorded a population growth rate of as much as 27.6%. In comparison, the number of electrical accidents per million population has been consistently declining.

The current cycle from 2015 to 2019 shows the average accident rate per million population falling by 18% compared to the previous 5-year cycle from 2010 to 2014. Cumulatively, there has been a 34.8% decrease in the number of electrical accidents per million population since 2005.

Overall, the average accident rate per million population declined from 2.79% (2005-2009) to 2.22% (2010-2014) to 1.82% (2015-2019).

Kadar Kemalangan per Populasi, Perbandingan Tempoh 5-Tahun
Electrical Accident Rate by Population, Comparative 5-Year Cycle



MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

Lokasi Kemalangan Elektrik

Dalam masa lima tahun yang lalu, pencawang elektrik, talian atas bervoltan tinggi dan bangunan kediaman merupakan tiga lokasi tertinggi berlakunya kemalangan elektrik.

Pencawang elektrik menjadi lokasi utama bagi kemalangan elektrik. Sebanyak 10 kes kemalangan telah berlaku di lokasi ini pada tahun 2019 (2018: tujuh kes). Kemalangan di bawah kategori ini biasanya melibatkan pekerja dan kontraktor serta penceroboh.

Lokasi talian atas bervoltan tinggi menyumbang kepada 12 kes kemalangan pada tahun 2019 (2018: lapan kes). Ini disebabkan oleh peningkatan aktiviti awam berdekatan dengan lokasi talian, seperti penggunaan mesin jentolak dan mesin menuai padi yang berdekatan dengan lokasi talian atas.

Bangunan kediaman mencatatkan lokasi kes kemalangan elektrik ketiga tertinggi antara 2005 dan 2019. Walau bagaimanapun, penurunan dicatatkan pada 2019, iaitu sebanyak dua kes berbanding dengan 15 kes pada tahun 2018. Ini menunjukkan penurunan sebanyak 18.8% berbanding jumlah kes pada tempoh lima tahun yang lepas dan sebanyak 27.8% pada tempoh 10 tahun sebelumnya.

Antara punca kemalangan di bangunan kediaman termasuk penggunaan telefon bimbit ketika sedang dicas, kebocoran elektrik di dalam atau menerusi sistem pemanas air dan penggunaan peralatan elektrik yang rosak.

Premis perindustrian, yang berada di kedudukan keempat berdasarkan jumlah kes direkod antara tahun 2015 dan 2019, mencatatkan sedikit peningkatan jumlah kes kepada 10 kes pada 2019 berbanding dengan lapan kes pada 2018. Lokasi ini dan lokasi pencawang elektrik mencatatkan jumlah kes kedua tertinggi pada 2019.

Electrical Accident Locations

In the past five years, the top three electrical accident locations are at electrical substations, high-voltage overhead lines and residential buildings.

Electrical substations remain as the primary location for accidents. In 2019, there were 10 accident cases recorded (2018: seven accidents). Accidents under this category typically involve staff and contractors as well as trespassers.

High-voltage overhead lines accounted for 12 accident locations in 2019 (2018: eight accidents). The contributing factors were increased public activities nearby, for example, the usage of excavators and rice harvesters in the vicinity of overhead lines.

Between 2005 and 2019, the third highest location for electrical accidents recorded was residential buildings. However, there was a decline in 2019 when two cases were recorded compared to 15 cases in 2018. This represents an 18.8% decline compared to cases in the previous five years, and as much as 27.8% compared to the previous 10-year period.

Among the main causes of accidents at residential buildings include the usage of mobile phones while charging, electrical leakages in or through water heater systems and the use of faulty electrical appliances.

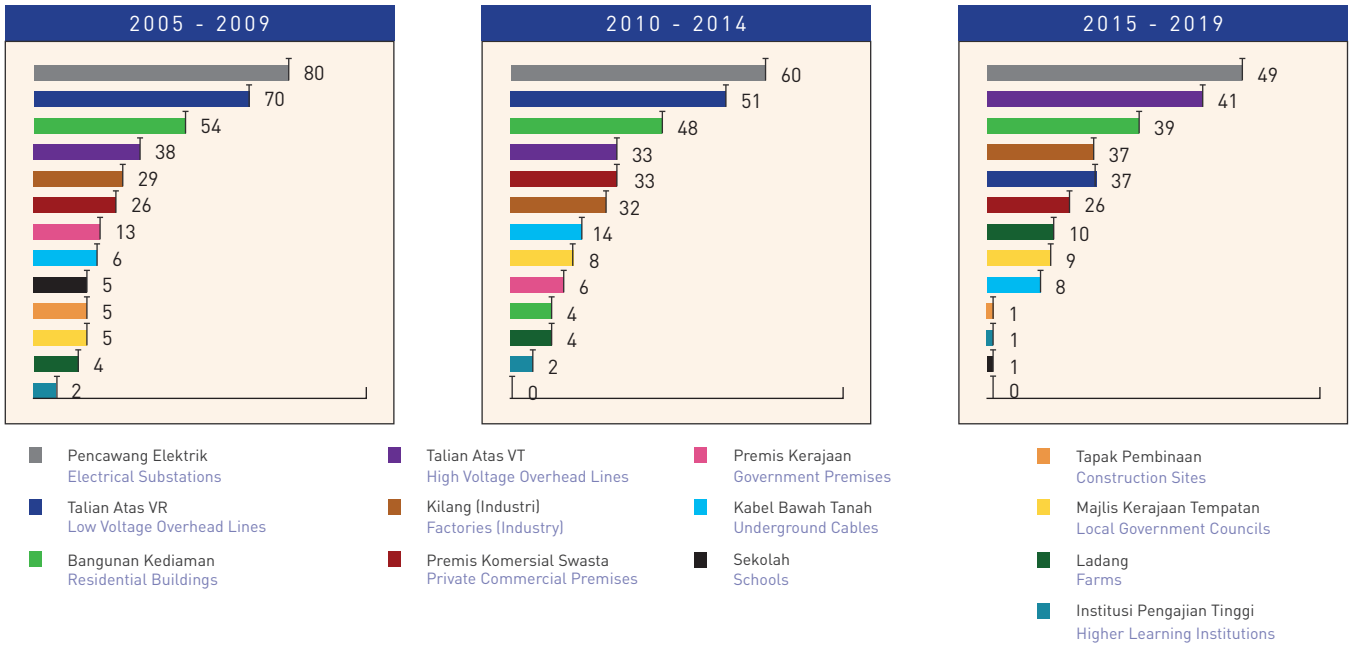
Industrial premises, which ranked fourth in the number of cases between 2015 and 2019, however recorded a slight increase in 2019, with 10 cases compared to eight in 2018. This location had the second highest number of cases in 2019 together with electrical substations.

Kemalangan di Pencawang Utiliti telah Berkurang
Accidents at Utility Substations have Declined

18.3% 2015-2019

ENHANCING SAFETY AND ENFORCEMENT

Kemalangan Elektrik mengikut Lokasi, Perbandingan Tempoh 5-Tahun
Electrical Accidents by Location, Comparative 5-Year Cycle



Kemalangan Elektrik mengikut Lokasi, 2005-2019
Electrical Accidents by Location, 2005-2019

Jenis Lokasi Location Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Jumlah Total
Bangunan Kediaman Residential Buildings	11	9	14	11	9	8	15	6	8	11	10	5	7	15	2	**141**
Sekolah Schools	1	0	2	1	1	0	0	0	0	0	0	0	0	0	1	**6**
Institusi Pengajian Tinggi Higher Learning Institutions	0	0	1	1	0	0	2	0	0	0	0	0	1	0	0	**5**
Kilang Factories	2	5	10	5	7	8	7	5	5	7	5	11	3	8	10	**98**
Majlis Kerajaan Tempatan Local Government Councils	0	3	0	1	1	3	2	2	0	1	1	2	3	2	1	**22**
Premis Kerajaan Government Premises	4	4	2	2	1	0	0	2	3	1	1	2	0	0	1	**23**
Premis Swasta Komersial Private Commercial Premises	6	4	5	7	4	10	4	4	6	9	1	6	7	6	6	**85**
Tapak Pembinaan Construction Sites	1	1	2	0	1	2	1	0	1	0	0	0	0	1	0	**10**
Talian Atas Voltan Rendah Low Voltage Overhead Lines	17	15	16	10	12	10	11	13	6	11	4	9	11	6	7	**158**
Talian Atas Voltan Tinggi High Voltage Overhead Lines	4	12	9	8	5	6	4	13	5	5	7	6	8	8	12	**112**
Pencawang Elektrik Electrical Substations	11	21	14	22	12	17	13	7	9	14	13	11	8	7	10	**189**
Kabel Bawah Tanah Underground Cables	0	3	0	2	1	3	2	2	3	4	1	0	3	2	2	**28**
Ladang Farms	0	2	0	0	2	2	1	1	0	0	5	2	2	1	0	**18**
Jumlah Total																**895**

MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

Punca Kemalangan Elektrik

Punca utama kemalangan elektrik pada keseluruhannya adalah pemasangan atau senggaraan yang tidak sempurna (35.4%). Ini diikuti dengan ketidakpatuhan kepada prosedur kerja selamat (31.3%), aktiviti kerja orang awam berhampiran dengan pepasangan elektrik (12.5%) dan pencerobohan di kawasan pepasangan elektrik (9%).

ST mencatatkan sebanyak 25 kes ketidakpatuhan pada prosedur kerja selamat pada tahun 2019 (2018: 17 kes); sebanyak 16 kes pemasangan dan senggaraan tidak sempurna (2018: 21 kes) dan sebanyak sembilan kes aktiviti kerja orang awam berhampiran dengan pepasangan elektrik (2018: 10 kes).

Causes of Electrical Accidents

Overall, the primary cause of electrical accidents is improper installation or maintenance (35.4%). This is followed by non-compliance of safe working procedures (31.3%), public activities nearby electrical installations (12.5%) and trespassing in the vicinity of electrical installations (9%).

In 2019, the Commission recorded 25 cases of non-compliance with safe working procedures (2018: 17 cases); 16 cases of improper installation or maintenance (2018: 21 cases) and nine cases of public activities nearby electrical installations (2018:10 cases).

Punca Kemalangan Elektrik, 2018 dan 2019
Causes of Electrical Accidents, 2018 and 2019

	2018	2019
Pemasangan/Senggaraan Tidak Sempurna Improper Installation/Maintenance	21	16
Prosedur Kerja Selamat Tidak Dipatuhi Non-Compliance of Safe Work Procedures	17	25
Aktiviti Kerja Orang Awam Berhampiran Pemasangan Elektrik Public Activities Near Electrical Installations	10	9
Pencerobohan di Pepasangan Elektrik Trespassing at Electrical Installations	0	0
Punca-punca Lain Other Causes	5	1
Salahguna Sistem Pendawaian Misuse of Wiring System	1	0
Kecacatan pada Peralatan/Perkakasan Elektrik Defective Electrical Appliances/Equipment	2	1
Jumlah Total	**56**	**52**

Secara keseluruhannya, purata jumlah kemalangan bagi tempoh 2015 ke 2019 telah menurun sebanyak 10.8% berbanding dengan tempoh lima tahun sebelumnya. Kegagalan untuk mematuhi prosedur kerja selamat kini merupakan punca utama kemalangan elektrik. Sepanjang dua tempoh lima tahun sebelumnya, iaitu antara 2005 ke 2009 dan 2010 ke 2014, ia berada pada kedudukan kedua tertinggi.

Untuk menangani isu ini, ST sentiasa melaksanakan sesi *engagement* dengan syarikat utiliti seperti TNB dan SESB, kontraktor dan Orang Kompeten, untuk memastikan prosedur kerja yang dilaksanakan mematuhi Akta, Peraturan, Kod, Arahan serta Garis Panduan. Pada masa yang sama, ST telah mengemaskini format dokumen Permit Menjalankan Kerja (PMK) untuk dijadikan sumber rujukan pada pemain industri dalam pelaksanaan sistem PMK yang sempurna. ST juga telah mengadakan bengkel dan dialog bersama pemegang taruh untuk menekankan kepentingan pematuhan kepada syarat PMK bagi mencegah kemalangan.

Overall, the average number of accidents for the 2015 to 2019 cycle declined 10.8%, compared to the previous five-year cycle. Failure to comply with safe working procedures has become the primary cause of electrical accidents currently. It ranked second during the previous two five-year cycles, from 2005 to 2009 and 2010 to 2014.

To address this issue, the Commission holds regular engagement sessions with utility companies like TNB and SESB, contractors and Competent Persons, to ensure work procedures are implemented in accordance with the Act, Regulations, Codes, Directives or Guidelines. Simultaneously, the Commission updated the Permit to Work (PTW) format documentation to serve as a reference tool for the industry to implement a sound PTW system. Workshops and dialogues were held with stakeholders to highlight the importance of complying with the PTW requirements to prevent accidents.

ENHANCING SAFETY AND ENFORCEMENT

ST juga telah mempergiatkan sesi *engagement* bersama TNB dan SESB menerusi inisiatif penubuhan Jawatankuasa Kemalangan Elektrik Bersama Utiliti yang memantau usaha pencegahan dan pembaikan dalam menyelesaikan isu-isu berpunca daripada kemalangan elektrik di pepasangan dan fasiliti TNB dan SESB. Mesyuarat telah diadakan setiap tiga atau empat bulan di mana arahan-arahan dikeluarkan untuk memastikan pepasangan elektrik adalah memenuhi peruntukan di bawah Akta, Peraturan, Kod, Arahan atau Garis Panduan. Arahan-arahan tersebut juga adalah bertujuan untuk meningkatkan pengetahuan kakitangan dan kontraktor utiliti agar kerja-kerja pemasangan dan penyelenggaraan dengan selamat dan efektif dapat dilaksanakan.

Antara contoh arahan-arahan yang dikeluarkan:

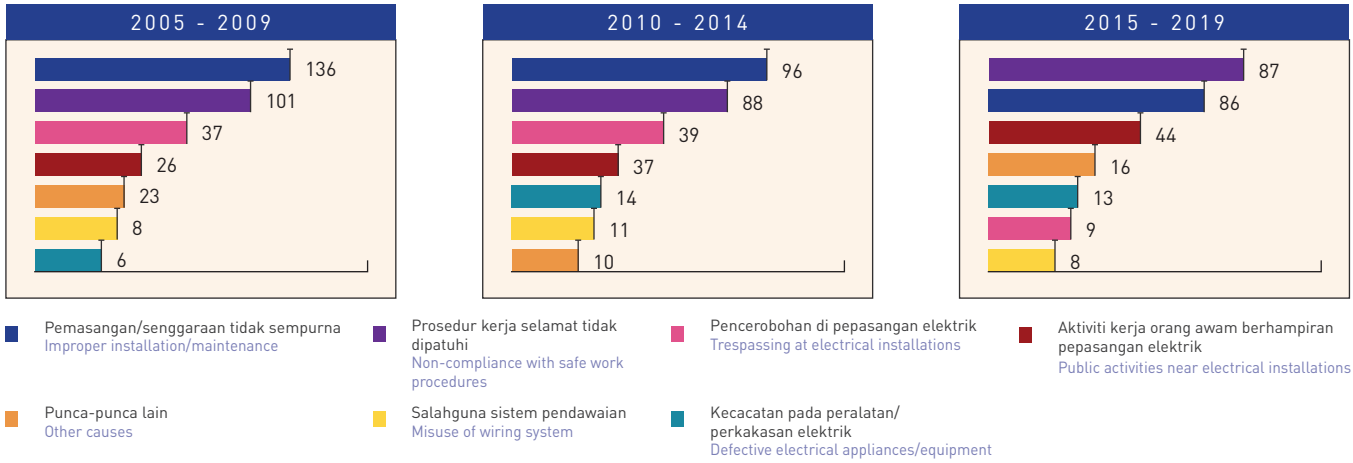
i. TNB dikehendaki mengamalkan praktis yang terkandung di dalam dokumen *Routine Inspection Regime (RIR)* dan dokumen Pematuhan Amalan Kejuruteraan ketika melakukan pemeriksaan di pepasangan elektrik.
ii. TNB dan SESB hendaklah menggantikan peralatan suis dan komponen-komponen yang lama untuk mengurangkan risiko kemalangan. Kerja-kerja penggantian ini membina untuk menjamin pembekalan tenaga jangka panjang yang berdaya harap.

The Commission also intensified engagements with TNB and SESB via the establishment of the Electrical Accidents Committee with Utilities, which monitors the preventive actions and improvements undertaken to resolve issues arising from electrical accidents at TNB and SESB properties and facilities. Meetings were held every three to four months, where instructions were issued to ensure electrical installations comply with the Act, Regulations, Codes, Directives or Guidelines. These instructions also aim to improve the knowledge of utility staff and contractors so they can carry out safe and effective installation or maintenance works.

Examples of such directives issued were:

i. TNB to practice the Routine Inspection Regime (RIR) and comply with the Engineering Compliance Practices (*Pematuhan Amalan Kejuruteraan*) when conducting inspections at electrical installations.
ii. TNB and SESB to replace aging switchgears and other components to mitigate the risk of accidents. These replacements are also considered necessary for sustainable energy supply.

Punca Kemalangan Elektrik, Perbandingan Tempoh 5-Tahun
Causes For Electrical Accidents, Comparative 5-Year Cycle



MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

KEGAGALAN MEMATUHI AMALAN KERJA SELAMAT

Failure to Comply with Safe Work Practices

Pada 2019, suatu kemalangan elektrik yang berpunca daripada kegagalan mematuhi prosedur kerja selamat untuk kerja henti tugas bersama yang melibatkan lebih daripada satu tugasan telah berlaku.

Dua tugasan telah dijadualkan dan didaftar mengikut Permit Menjalankan Kerja (PMK). Namun begitu, satu tugasan tambahan di luar skop PMK turut dijalankan. Tindakan ini telah mengakibatkan kemalangan maut seorang pekerja yang sedang menjalankan tugasan tambahan tersebut.

Siasatan menunjukkan bahawa punca kemalangan adalah disebabkan oleh kegagalan penyelarasan, di mana Orang Kompeten yang terbabit tidak dimaklumkan bahawa terdapat tugasan tambahan dan seterusnya menyebabkan PMK bagi tugasan tambahan tersebut tidak dikeluarkan. Keadaan ini telah menyebabkan kegagalan penyelarasan dan kawalan sepenuhnya tugasan sepanjang operasi henti tugas tersebut.

Siasatan tersebut menunjukkan kegagalan menyelaras prosedur kerja selamat akibat ketiadaan penyelarasan dalam kerja-kerja elektrik, seperti:

- Tiada kebenaran dan rekod bagi kerja tambahan; mengakibatkan kegagalan dalam pemberian maklumat sepenuhnya untuk pelaksanaan tugas.
- Tiada PMK mandatori dikeluarkan untuk membenarkan kerja-kerja tambahan.
- Pelaksanaan kerja tambahan tidak mematuhi prosedur PMK.

In 2019, an electrical accident occurred due to non-compliance of safe work procedures where a joint outage operation involved more than one task was conducted.

Two tasks were scheduled and registered on the Permit To Work (PTW). However, an additional task was also carried out, without any PTW issued. This resulted in a fatal accident involving the worker who was carrying out the additional task.

Upon investigation, it was found that the lack of coordination had caused the accident, where the Competent Person was not informed of the additional task that was being carried out, and thus did not issue a PTW for that specific task. This resulted in his failure to fully coordinate and supervise the tasks that were being carried out during the joint outage.

The investigation highlighted the failure of a safe system of work due to the absence of coordination between the various parties involved in the electrical works, namely:

- Unauthorised and unrecorded additional joint outage work; resulting in the failure to provide the complete information during work implementation.
- No mandatory PTW was issued to permit the additional joint outage work.
- The joint outage work did not comply to PTW procedures.

KEMALANGAN GAS BERPAIP
PIPED GAS ACCIDENTS

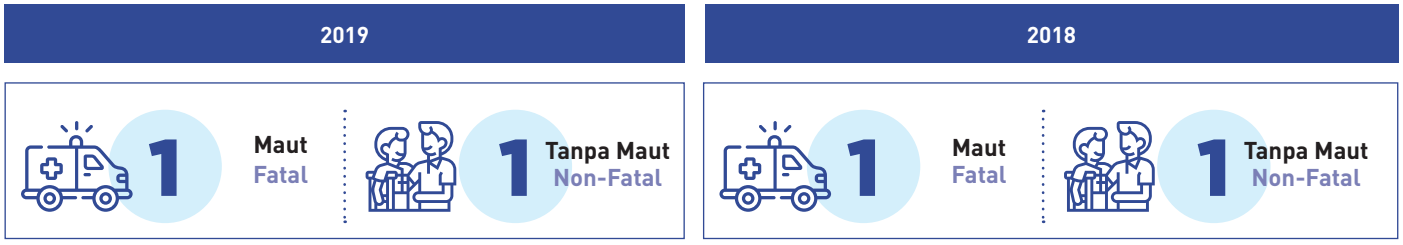
Dua kemalangan gas berpaip dicatatkan pada 2019 (2018: dua kemalangan). Kedua-dua tahun tersebut telah mencatatkan satu kes maut dan satu kes tanpa maut.

Pada 2019, suatu kes maut telah berlaku di projek penyaluran Gas Asli ke Kawasan Perindustrian Lembah Kinta di Perak. Manakala, kemalangan tanpa maut telah berlaku di restoran sebuah hotel di Lembah Klang.

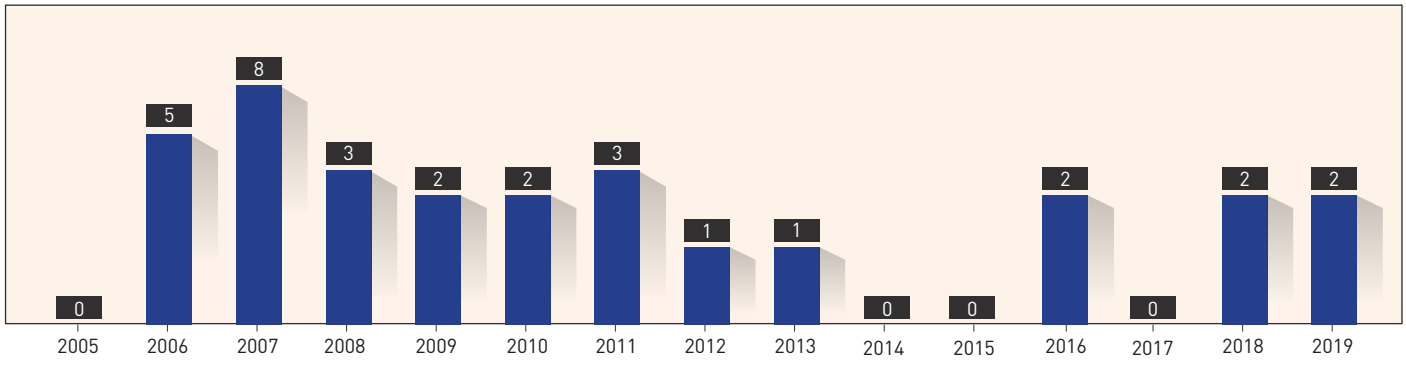
In 2019, there were two recorded piped gas accidents (2018: two accidents). In each of these years, there was one fatal accident and one non-fatal accident.

The 2019 fatality occurred at a natural gas distribution pipeline supplying gas to the Kinta Valley Industrial Area in Perak. The non-fatal accident occurred in a restaurant at a hotel in the Klang Valley.

Kemalangan Gas, 2018 dan 2019
Gas Accidents, 2018 and 2019



Kes Kemalangan Gas, 2005-2019
Gas Accidents Cases, 2005-2019



MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

Lokasi Kemalangan Gas

Lokasi bagi kemalangan gas didapati telah mengalami trend peralihan, sejak lima tahun kebelakangan ini. Pada awalnya, di antara tahun 2005 ke 2009, kemalangan gas sering berlaku di pepasangan gas berpaip di bawah tanah, dan sedikit sebanyak di rumah dan pusat membeli-belah. ST telah berjaya mengurangkan kadar kemalangan di segmen pasaran ini melalui pengemasan prosedur pelesenan bagi kontraktor gas berpaip.

Cabaran bagi tahun 2015 ke 2019 pula telah muncul akibat daripada kenaikan bilangan perniagaan dobi yang menggunakan Gas Petroleum Cecair (LPG) sebagai sumber tenaga utama mereka. LPG dilihat sebagai sumber tenaga yang lebih efisien dari segi kos bagi pemilik perniagaan dobi.

Siasatan ST menunjukkan bahawa kebanyakan sistem gas berpaip di premis perniagaan dobi tidak mematuhi Akta Bekalan Gas 1993, Peraturan Bekalan Gas 1997 dan piawaian *Malaysian Standards*. Ini adalah antara punca-punca utama berlakunya kemalangan gas di premis ini.

Bagi menangani isu ini, ST telah menerbitkan buku panduan *Guidelines on Gas Piping System at Launderettes and Similar Installations* pada 2019 sebagai rujukan mudah untuk kontraktor pepasangan sistem gas berpaip. Langkah ini turut memastikan premis-premis tersebut tidak akan membahayakan pekerja, pelanggan dan orang awam.

Gas Accident Locations

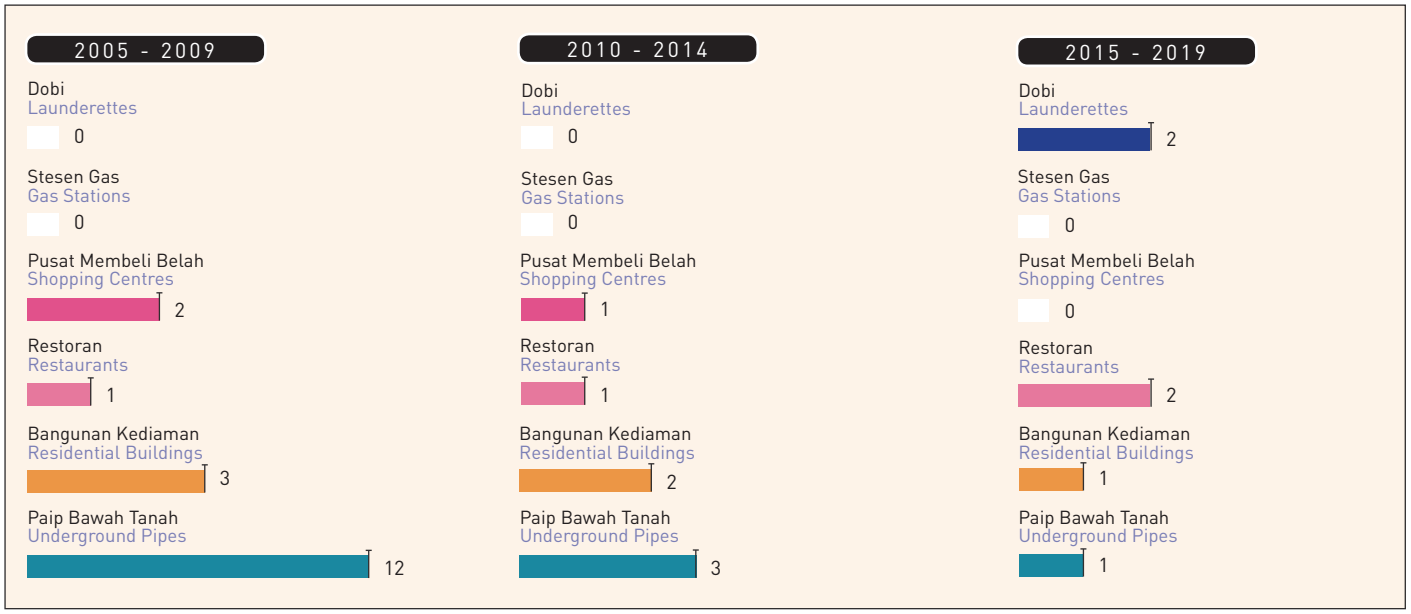
There has been a shift in gas accident locations in the past five years. Initially, from 2005 to 2009, gas accidents occurred primarily at underground gas installations, and to a lesser extent, at homes and shopping centres. By becoming more rigorous with licensing conditions of gas pipeline contractors, the Commission successfully reduced the accident rate at these locations.

The challenge in 2015 to 2019 was the influx of launderettes using Liquefied Petroleum Gas (LPG) as their primary source of power. Launderette owners find it more cost efficient to use LPG as the fuel of choice.

Investigations by the Commission showed safety features of gas piping systems in launderettes did not comply with the Gas Supply Act 1993, Gas Supply Regulations 1997 and the Malaysian Standards. This triggered gas accidents at these premises.

To address this issue, in 2019, the Commission published the Guidelines on Gas Piping System at Launderettes and Similar Installations to serve as an easy reference for contractors installing gas piping systems. The measure is also to ensure that these premises do not endanger the safety of the workers, customers and the public.

Lokasi Kemalangan Gas, Perbandingan Tempoh 5-Tahun
Gas Accident Locations, Comparative 5-Year Cycle



ENHANCING SAFETY AND ENFORCEMENT

Punca Kemalangan Gas

Seperti kemalangan elektrik, kegagalan untuk mematuhi prosedur kerja selamat adalah punca utama kemalangan gas. Ianya telah menyebabkan empat kes kemalangan maut bagi tempoh 2015 ke 2019.

Di sepanjang tempoh ini, kategori ini juga menunjukkan kenaikan mendadak sebanyak 75% berbanding tempoh lima tahun sebelumnya. Siasatan menunjukkan bahawa kebanyakkannya disebabkan oleh kontraktor dan pemegang lesen yang tidak mematuhi prosedur kerja yang ditetapkan. Didapati bahawa punca utamanya adalah pekerja pemasangan dan penyelenggaraan yang tidak berpengalaman dan tidak dikawal selia oleh Orang Kompeten yang berdaftar dengan ST. Kontraktor yang dilantik bagi kerja pepasangan gas juga tidak berdaftar dengan ST seperti yang telah ditetapkan oleh undang-undang.

Rekod juga menunjukkan bahawa kemalangan berpunca daripada aktiviti pihak ketiga berhampiran dengan pepasangan talian gas berpaip telah berkurangan sebanyak 100% sejak lima tahun yang lepas, di mana lokasi ini paling kerap berlakunya kemalangan bagi tempoh tahun 2010 ke 2014. Sebahagian besar daripada kerja pihak ketiga pada ketika itu telah melibatkan kerja penggalian berhampiran pepasangan talian gas berpaip di bawah tanah bagi tujuan menyalurkan gas asli ke kawasan perindustrian.

Pengurangan drastik ini adalah hasil daripada usaha berterusan ST yang melibatkan pemegang lesen gas dalam perbincangan untuk mempertingkatkan pengedaran gas dan mengurangkan kemalangan. Antara inisiatif yang dibincangkan adalah bagi pemegang lesen gas dan pemilik talian gas berpaip untuk mengetahui prosedur penggalian yang selamat. Mereka juga digalakkan untuk meningkatkan kadar pemeriksaan harian di sepanjang talian gas berpaip untuk mencegah kerja-kerja pengorekan yang tidak berdaftar di mana ianya boleh menyebabkan kemalangan.

Causes of Gas Accidents

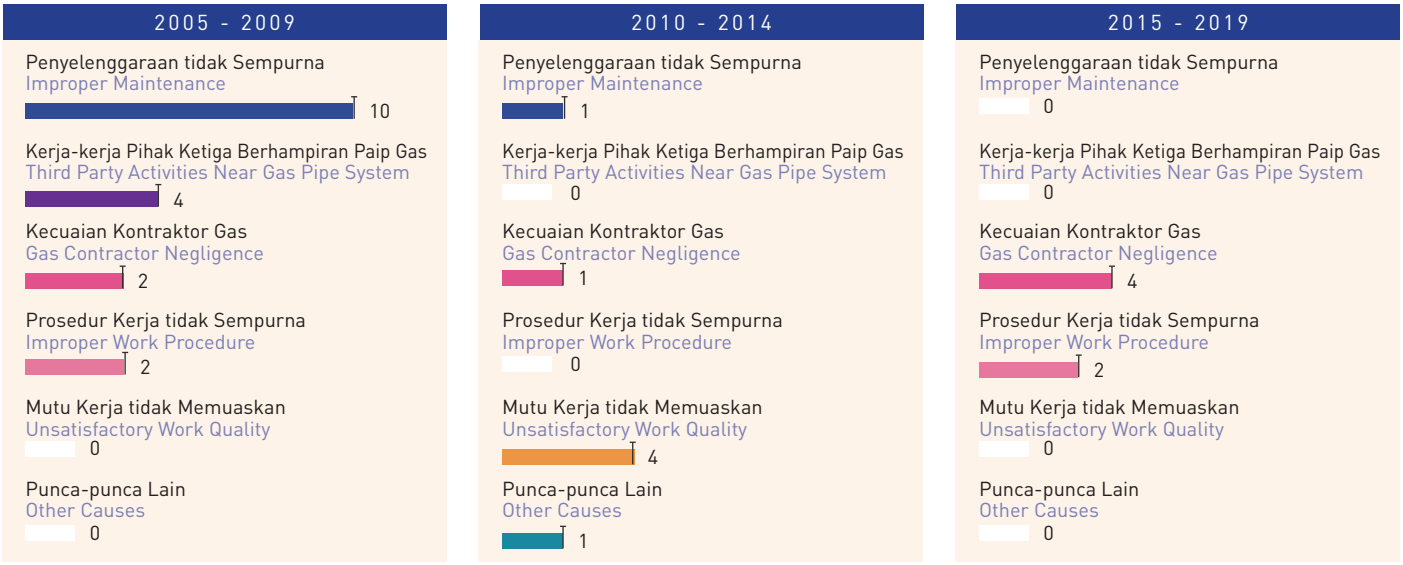
Similar to electrical accidents, the primary cause for gas accidents is non-compliance of safe working procedures. This caused four fatal accidents in the period 2015 to 2019.

During this period, there was a sharp 75% increase in this category of cases compared to the previous five-year cycle. Investigations showed that this was mainly due to non-compliance of authorised work procedures by both contractors and licensees. The root cause was that workers employed to undertake installation and maintenance works were inexperienced and not supervised by Competent Persons registered with the Commission. Contractors employed for gas installations were also not registered with the Commission, as required by law.

Records show that accidents caused by third party activities near gas pipeline installations have decreased by 100% in the past five years; where most accidents occurred previously, in the 2010 to 2014 cycle. The majority of third party activities then involved excavation works near underground gas pipelines to distribute natural gas to industrial areas.

This drastic reduction can be attributed to the Commission's ongoing efforts to engage with gas licensees in joint discussions to improve gas distribution and reduce accidents. Among the initiatives was for gas licensees and pipeline owners with comply with safe excavation procedures. They were also encouraged to increase daily inspection of the pipeline tracks to prevent unauthorised digging works that could trigger accidents.

Punca Kemalangan Gas, Perbandingan Tempoh 5-Tahun
Causes of Gas Accidents, Comparative 5-Year Cycle



MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

PEMANTAUAN DAN PEMERIKSAAN
MONITORING AND INSPECTION

Ibu pejabat ST di Putrajaya bersama-sama sembilan Pejabat Kawasannya memainkan peranan yang penting dalam memantau dan memeriksa pepasangan, kemudahan dan peralatan elektrik. ST berperanan memastikan piawaian keselamatan dipatuhi mengikut Akta Bekalan Elektrik 1990. Pemeriksaan dijalankan ke atas pengguna-pengguna industri kecil, komersil dan domestik, termasuk kilang, hotel, pusat membeli-belah dan kediaman. Pepasangan elektrik dan gas yang besar pula dikenakan audit pengurusan keselamatan elektrik.

Pada 2019, ST telah memeriksa sebanyak 824 premis (2018: 957 premis) dan telah mengeluarkan 142 notis pematuhan (2018: 350 notis) kepada pemilik perniagaan. Sebanyak 185 audit (2018: 199 audit) pula telah dijalankan, dan 80 notis pematuhan (2018: 131 notis) telah dikeluarkan.

Berikut merupakan pemeriksaan yang dilakukan pada tahun 2019; yang mana mencerminkan isu-isu semasa.

The Commission's head office in Putrajaya together with its nine Regional Offices undertake close monitoring of electrical installations, facilities and appliances. Their role is to ensure safety standards are met in accordance with the Electricity Supply Act 1990. To achieve this, they inspect smaller industrial, commercial and domestic consumers, ranging from factories to hotels, shopping malls and households. In addition, larger electrical and gas installations are subject to electrical safety management audits.

In 2019, the Commission inspected 824 premises (2018: 957 premises) and issued 142 notices for non-compliance (2018: 350 notices) to business owners. In addition, a total of 185 audits (2018: 199 audits) were conducted, and 80 non-compliance notices (2018: 131 notices) were issued.

Below are the types of inspections carried out in 2019, reflecting current areas of concern.

Jumlah Pemeriksaan pada 2019
Total Inspections in 2019

Pemeriksaan Pepasangan Elektrik
Inspection of Electrical Installations
564 premis / premises

Pemeriksaan Pepasangan Gas (Keutamaan di Kedai-Kedai Dobi)
Inspection of Gas Installments (Priority for Launderettes)
222 premis / premises

Pemeriksaan Orang Kompeten (untuk LSS)
Inspection of Competent Persons (for LSS)
577 premis / premises

Pemeriksaan Pelesenan Persendirian Bawah 5MW
Inspection of Private Licences Below 5MW
260 premis / premises

Audit Kerja Senggaraan oleh Pemegang Lesen
Maintenance Audit by Licence Holders
61 kerja senggaraan / maintenance works

Operasi Bersepadu di Kompleks Beli-Belah
Joint Operations at Shopping Centres
9 premis / premises

Pemeriksaan Kontraktor Berdaftar
Inspection of Registered Contractors
162 premis / premises

Pemeriksaan Pepasangan Elektrik di Taman Awam
Inspection of Electrical Installations in Public Parks
118 premis / premises

Pemeriksaan Kelengkapan (Pengilang/Pengimport)
Inspection of Equipment (Manufacturer/Importer)
22 premis / premises

Program / Plan Pengurusan Keselamatan
Audit Safety Management Plan/ Programme
185 premis / premises

Pemeriksaan Pematuhan Pengurus Tenaga Elektrik
Inspection of Compliance by Electrical Energy Managers
65 premis / premises

Pemeriksaan Tapak Binaan
Inspection of Construction Sites
117 premis / premises

Pemeriksaan Kelengkapan (Outlet)
Inspection of Equipment (Outlets)
172 premis / premises

Seminar Kesedaran Keselamatan Elektrik/Gas dan Kecekapan Tenaga
Electrical/Gas Safety and Energy Efficiency Awareness Seminar
41 seminar / seminars

ENHANCING SAFETY AND ENFORCEMENT

Audit di pepasangan berkapasiti besar: ST menjalankan Audit Program Pengurusan Keselamatan Elektrik di TNB, SESB, Penjana Bebas (IPP) dan pepasangan elektrik di institusi awam seperti hospital Kerajaan. Audit ini bertujuan untuk memastikan pepasangan elektrik di seluruh Semenanjung Malaysia dan Sabah berada dalam keadaan baik dan dapat membekalkan elektrik secara berterusan.

Audit ini juga bertujuan untuk mengawal atau mengurangkan SAIDI, iaitu ukuran tempoh gangguan bekalan elektrik.

Outlet barangan elektrik: Sejak kebelakangan ini, ST telah memantau dengan lebih teliti outlet yang menjual produk elektrik terkawal di kompleks membeli-belah. Pada tahun 2019, ST telah memeriksa 172 buah outlet untuk memastikan label SIRM-ST ada pada setiap barangan elektrik yang dijual. Sebanyak 106 notis penarikan semula telah dikeluarkan ke atas barangan elektrik yang tiada kelulusan dan membahayakan pengguna.

Pengilang dan pengimport peralatan elektrik: Pengilang dan pengimport kelengkapan elektrik yang tiada kelulusan turut menjadi isu sejak kebelakangan ini. Pada tahun 2019, ST telah memeriksa 22 premis pengilang dan pengimport serta telah mengeluarkan tujuh notis pematuhan.

Premis kontraktor elektrik dan tapak pembangunan hartanah: Premis Kontraktor Elektrik berdaftar turut diperiksa, untuk memastikan bahawa mereka memenuhi kesemua syarat-syarat pendaftaran. Pada tahun 2019, Pejabat Kawasan ST telah membuat lawatan ke 162 premis dan mengeluarkan 80 notis pematuhan kepada pemunya premis. Mereka juga telah melawat 117 tapak pembangunan hartanah dan mengeluarkan 37 notis pematuhan kepada pemunya premis.

Perlantikan Pengurus Tenaga Elektrik: Premis-premis yang menggunakan tenaga sebanyak 3,000,000 kWj secara berterusan selama enam bulan dikehendaki melantik Pengurus Tenaga Elektrik yang akan memantau piawaian keselamatan dan penggunaan tenaga. ST telah melawat 65 premis tersebut untuk memastikan bahawa Pengurus Tenaga telah dilantik. Sebanyak 12 notis pematuhan telah dikeluarkan kepada pemunya semasa lawatan-lawatan tersebut.

Pemeriksaan ke atas pepasangan gas: Seperti juga pepasangan elektrik, ST adalah komited bagi memastikan pepasangan gas berada dalam keadaan yang selamat dan baik. Pepasangan gas kebanyakannya didapati di hospital, hotel dan restoran. Pada 2019, sebanyak 222 pemeriksaan telah dilakukan dan 135 notis telah dikeluarkan kepada pihak pengurusan premis untuk memperbetulkan sistem pepasangan gas mereka.

Audits at large installations: The Commission conducts Electrical Safety Management Audits at TNB, SESB, Independent Power Producers (IPPs) and electrical installations at public institutions such as Government hospitals. The audits aim to ensure all electrical installations in Peninsular Malaysia and Sabah are in good working order for continuous power supply.

The audits also aim at containing or reducing SAIDI, which measures the duration of power interruptions or outages.

Electrical goods outlets: In recent years, the Commission has started closely monitoring outlets selling controlled electrical equipment at shopping malls. In 2019, the Commission inspected 172 outlets to ensure that their electrical equipment carried the SIRIM-ST label. These inspections resulted in the issuance of 106 notices for the withdrawal of non-certified electrical goods that may be hazardous to buyers.

Electrical appliance manufacturers and importers: Another area of concern in recent years is manufacturers and importers of non-certified electrical products. In 2019, the Commission's officers inspected 22 factories and premises of importers where seven compliance notices were issued.

Electrical contractor premises and property development sites: The premises of registered Electrical Contractors are subject to inspection, to ensure they meet their registration terms and conditions. In 2019, Regional Office staff visited 162 of these offices and issued 80 notices of compliance. They also visited 117 property development sites and issued 37 compliance notices.

Appointment of Energy Managers: Premises using 3,000,000 kWh of electrical power continuously for six months are required to appoint Electrical Energy Managers to monitor their power consumption and safety standards. The Commission visited 65 such premises to ensure that the management had appointed Energy Managers. A total of 12 non-compliance notices were issued during the year.

Inspection of gas installations: Like electrical installations, the Commission is committed to ensuring gas installations are safe and in good working order. Gas installations are mainly found in hospitals, hotels and restaurants. In 2019, the Commission conducted 222 inspections and issued 135 notices to the management to rectify their systems.

MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

PENGUATKUASAAN
ENFORCEMENT

Pada 2019, ST telah menjalankan operasi penguatkuasaan yang telah mengenalpasti 53 premis yang disyaki melanggar peraturan dan undang-undang berkaitan. 25 premis telah didapati menggunakan elektrik secara curang; 16 premis dengan kelengkapan elektrik yang tiada kelulusan; tiga kilang plastik dengan pepasangan elektrik haram; dan sembilan kompleks membeli-belah yang menjual peralatan elektrik yang tiada kelulusan.

Berikutan operasi tersebut, ST telah membuka 12 kertas siasatan bagi kes penggunaan elektrik secara curang dan 16 kertas siasatan bagi kes penjualan peralatan elektrik yang tiada kelulusan.

In 2019, the Commission conducted enforcement operations that uncovered 53 premises suspected of flouting the rules and regulations governing them. They involved 25 premises operating with the dishonest use of electricity; 16 premises with non-compliant electrical equipment; three plastic factories with illegal power installations; and nine shopping centres with stores selling unauthorised electrical appliances.

Subsequently, the Commission opened 12 investigation papers for cases involving the dishonest use of electricity and 16 investigation papers for selling unauthorised electrical equipment.

Operasi Penguatkuasaan pada 2019
Enforcement Operations in 2019

Operasi Operations	**Bil.** Nos.	**Bil. Kertas Siasatan Dibuka** Nos. of Investigation Papers Opened
Penguatkuasaan Penggunaan Elektrik Secara Haram Enforcement Operations for Illegal Use of Electricity	**25**	**12**
Operasi Penguatkuasaan Penggunaan Kelengkapan Elektrik Tanpa Kebenaraan Enforcement Operations for Unauthorised Electrical Equipment	**16**	**16**
Operasi Penguatkuasaan Pepasangan Elektrik Haram Enforcement Operations for Illegal Electrical Installations	**3**	–
Operasi Kompleks Pasaraya – Penjualan Peralatan Elektrik yang Tiada Kelulusan Enforcement Operations in Shopping Centres - Sale of Non-Approved Equipment	**9**	–

SEMINAR DAN DIALOG
Seminars and Dialogues

ST telah mengadakan seminar dan dialog dengan pelbagai pemegang taruh di seluruh negara sebagai suatu langkah pencegahan awal. Para peserta telah diberi taklimat mengenai kepentingan mematuhi piawaian keselamatan dan peraturan-peraturan yang ditetapkan semasa menggunakan tenaga elektrik. serta mengedar dan menjual kelengkapan elektrik.

Pada 26 November 2019, ST telah mengadakan taklimat keselamatan sebagai persediaan pemindahan sistem pembekalan elektrik ketika bencana banjir di Kelantan. Perbincangan tentang inisiatif bersama TNB telah dilaksanakan untuk memastikan bekalan elektrik kekal berterusan semasa bencana banjir di Pahang, Terengganu dan Kelantan.

To prevent non-compliance, the Commission conducts seminars and dialogues with various stakeholders in the country. During these sessions, participants are briefed on the importance of observing safety standards and regulatory compliances while using electricity, as well as in the distribution and sale of electrical equipment.

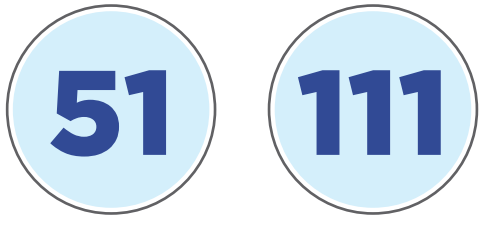
On 26 November 2019, the Commission conducted a safety briefing in preparation for the relocation of electrical systems during the flood disaster in Kelantan. The Commission discussed initiatives, undertaken with TNB, to ensure the continuity of power supply during the floods in Pahang, Terengganu and Kelantan.

PENYIASATAN
INVESTIGATION

Pada 2019, ST telah membuka 111 kertas siasatan (2018: 51 kertas) bagi pelbagai kategori kesalahan, yang merangkumi kes maut yang melibatkan manusia dan haiwan, penggunaan elektrik dengan curang, kebakaran serta peralatan dan pepasangan elektrik yang tidak diluluskan.

In 2019, the Commission opened 111 investigation papers (2018: 51 papers) for various offences, from fatalities involving people and animals to dishonest use of electricity, fire and non-compliant electrical equipment and installations.

Bilangan Kertas Siasatan
Number of Investigation Papers



MENINGKATKAN KESELAMATAN DAN PENGUATKUASAAN

Kategori Kertas Siasatan Category of Investigation Papers	2018	2019
Kemalangan Elektrik Tanpa Maut Non-Fatal Electrical Accidents	13	**18**
Maut (Haiwan) Fatal (Animal)	4	**2**
Kemalangan Bukan Elektrik Tanpa Maut Non-Fatal Non-Electrical Accidents	0	**4**
Kebakaran Fire	1	**0**
Gangguan Bekalan Elektrik Interruptions of Electricity Supply	3	**7**
Aduan Complaints	2	**40**
Gas (Maut) Gas (Fatal)	1	**1**
Gas (Tanpa Maut) Gas (Non-Fatal)	1	**0**
Operasi Curi Elektrik Operations Electricity Theft	10	**12**
Operasi Kelengkapan Operations Equipment	3	**16**
Operasi Pepasangan Operations Installation	1	0
Operasi Pengurus Tenaga Operations Energy Managers	1	**0**
Operasi Gas Operations Gas	2	**0**
Jumlah Total	**51**	**111**

PENDAKWAAN
PROSECUTION

Setelah selesai siasatan, ST akan memulakan pendakwaan menurut prosedur proses yang sewajarnya. Tindakan susulan hasil siasatan pada tahun 2019 adalah:

- Penyerahan 50 kes kepada Timbalan Pendakwa Raya, bersama cadangan kompaun sebagai penalti.
- Penyerahan 10 kes kepada Timbalan Pendakwa Raya, untuk pendakwaan.
- Pengeluaran sebanyak 36 kompaun bernilai RM3.6 juta atas kesalahan-kesalahan di bawah Akta Bekalan Elektrik 1990 dan Peraturan.

Upon completion of investigation, the Commission initiates prosecution in accordance with the due process. In 2019, its investigations led to:

- Referral of 50 cases to the Deputy Public Prosecutor, with a recommendation of compounds as a penalty.
- Referral of 10 cases to the Deputy Public Prosecutor, for prosecution.
- Issuance of 36 compounds valued at RM3.6 million for offences committed under the Electricity Supply Act 1990 and Regulations.

ENHANCING SAFETY AND ENFORCEMENT

- Pendakwaan dua kes, iaitu:
  - Tesomac Sdn Bhd telah didenda sebanyak RM8,000 oleh Mahkamah Sesyen Klang kerana kegagalan mendaftar pepasangan elektrik miliknya.
  - Shantawood Manufacturing Sdn Bhd yang telah didenda sebanyak RM5,000 oleh Mahkamah Sesyen Melaka kerana kegagalan untuk melantik Orang Kompeten bagi mengendali kerja pepasangan elektrik miliknya.

Pembatalan dan Penggantungan Perakuan Kekompetenan

Pada 2019, ST telah membatalkan secara mutlak dua Perakuan Kekompetenan dan menggantung tiga perakuan Orang Kompeten. Mereka telah didapati cuai dalam melaksanakan tugasan mereka sebagai Orang Kompeten.

- Prosecution of two cases, namely:
  - Tesomac Sdn Bhd that was fined RM8,000 by the Klang Sessions Court for failure to register its electrical installations.
  - Shantawood Manufacturing Sdn Bhd that was fined RM5,000 by the Melaka Sessions Court for failure to appoint a Competent Person to operate its electrical installations.

Revocation and Suspension of Certificate of Competency

In 2019, the Commission revoked absolutely two Certificates of Competency and suspended three other certificates of Competent Persons found to be negligent in discharging their duties.

Bil. Nos.	**Nama** Name	**No. Perakuan Kekompetenan** Certificate of Competency No.	**Butiran Kesalahan** Offence Details	**Keputusan** Result	**Tarikh Berkuatkuasa** Effective Date
1	Omarddy Ramis (No. K/P:820516-12-6039)	PJ-T7-H-0056-2015 PJ-T6-B-0053-2018	Subperaturan 112(2) PPE 1994	Perakuan Kekompetenan digantung selama tiga tahun di bawah subperaturan 59(8) PPE 1994 Certificate of Competency suspended for three years under subregulation 59(8) ER 1994	19 Disember 2019 19 December 2019
2	Abdullah Baron (No. K/P: 800812-12-5227)	PJ-T7-H-0089-2016	Subseksyen 37(2) ABE 1990 Subperaturan 112(5) PPE 1994	Perakuan Kekompetenan digantung selama satu tahun di bawah subperaturan 59(8) PPE 1994 Certificate of Competency suspended for one year under subregulation 59(8) ER 1994	19 Disember 2019 19 December 2019
3	Safly Ahmad (No. K/P: 800619-12-5065)	PJ-T7-H-0046-2015	Subseksyen 37(2) ABE 1990 Subperaturan 112(2) PPE 1994	Perakuan Kekompetenan dibatalkan secara mutlak di bawah subperaturan 59(8) PPE 1994 Certificate of Competency revoked absolutely under subregulation 59(8) ER 1994	19 Disember 2019 19 December 2019
4	Vhino Welli (No. K/P: 890826-12-5641)	PJ-T2-H-0055-2017	Subseksyen 37(2) ABE 1990 Subperaturan 112(2) PPE 1994	Perakuan Kekompetenan dibatalkan secara mutlak di bawah subperaturan 59(8) PPE 1994 Certificate of Competency revoked absolutely under subregulation 59(8) ER 1994	19 Disember 2019 19 December 2019

BAB 03
CHAPTER 03

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Mengimbangi keberterusan dan kemampanan tenaga dan buat masa yang sama memastikan pembekalan tenaga terus adil dan kekal pada harga yang berpatutan merupakan cabaran global abad ke-21. Keadaan ini juga dikenali sebagai Trilema Tenaga. Di Malaysia, keberterusan tenaga adalah penting bagi memacu pembangunan ekonomi. Ianya sentiasa diperkukuhkan dengan meningkatkan sumbangan Tenaga Boleh Baharu (TBB) yang mampan dalam campuran kapasiti, dengan sasaran untuk mencapai sebanyak 20% TBB dalam campuran kapasiti terpasang menjelang tahun 2025.

Kerajaan juga telah memperkenalkan pelbagai peraturan dan inisiatif kecekapan tenaga supaya pengguna menjadi lebih bijak dalam penggunaan tenaga mereka. Langkah-langkah penjanaan dan penggunaan tenaga ini bertujuan untuk mengurangkan pelepasan gas karbon daripada industri pembekalan elektrik dan gas berpaip, bagi membolehkan Malaysia memenuhi komitmen Perjanjian Paris 2016 untuk mengurangkan intensiti pelepasan gas karbon sebanyak 35% menjelang 2030.

Balancing energy security and sustainability while ensuring that energy supply remains equitable and affordable is a 21st century global challenge, also known as the Energy Trilemma. In Malaysia, energy security that is vital to propel economic development is being strengthened by increasing the share of sustainable Renewable Energy (RE) in the capacity mix. The target is to have 20% RE by 2025 in the installed capacity mix.

The Government has also introduced various energy efficiency regulations and initiatives to make consumers more prudent about their power consumption. These energy generation and consumption measures aim to reduce carbon emissions from the electricity and piped gas supply industry, to enable Malaysia to meet its 2016 Paris Agreement commitment for a 35% reduction in carbon emissions intensity by 2030.

SOROTAN 2019
2019 HIGHLIGHTS

- Kementerian telah meluluskan Pelan Pembangunan Penjanaan 10-tahun untuk Semenanjung Malaysia dan Sabah bagi tempoh 2020–2030. Pelan ini tertumpu kepada peningkatan bahagian TBB dalam campuran kapasiti.
  - Di Semenanjung Malaysia, pilihan utama TBB adalah tenaga solar manakala di Sabah pula adalah tenaga hidro.
  - Margin rizab dijangka berkurangan ke tahap yang lebih optimal menjelang 2030.
- Sepanjang 2019, lima syarikat telah dianugerahkan sebanyak 490.88MW kapasiti penjanaan, di bawah Program Solar Berskala Besar (LSS). Menjelang penghujung tahun, terdapat 21 projek LSS yang telah mula beroperasi; Semenanjung Malaysia dengan 608.3MW tenaga solar dalam campuran bahan api keseluruhannya sementara Sabah pula dengan 50MW.
- Lebih daripada 100 bangunan Kerajaan utama termasuk Pejabat Perdana Menteri, Perdana Putra, telah memperolehi pelabelan prestasi Intensiti Tenaga Bangunan (BEI) setakat 2019. Bangunan kerajaan merupakan perintis inisiatif bagi Pelabelan Prestasi BEI Kebangsaan untuk kecekapan tenaga dalam sektor bangunan.
- Pada Julai 2019, ST dilantik sebagai Pengurus Projek untuk merangka Rang Undang-Undang (RUU) Kecekapan dan Konservasi Tenaga untuk dibentangkan di Parlimen pada 2021.

- The Ministry approved the 10-year Generation Development Plans for Peninsular Malaysia and Sabah for the period 2020-2030. The plans are focused on increasing the share of RE in the capacity mix.
  - In Peninsular Malaysia, the preferred RE is solar power while in Sabah, it is hydro.
  - The reserve margin is set to decline to more optimal levels by 2030.
- In 2019, the Large Scale Solar (LSS) programme awarded five companies 490.88MW generating capacity under the third bidding cycle. By year end, there were 21 LSS farms that were operational; Peninsular Malaysia had 608.3MW of solar energy in the overall fuel capacity mix, while Sabah took up 50MW.
- More than 100 prominent Government buildings including the Prime Minister's Office and Perdana Putra became Building Energy Intensity (BEI) labelled in 2019. Government buildings are the pioneers of the National BEI Performance Labelling initiative for energy efficiency in the building sector.
- In July 2019, the Commission was appointed as Project Manager to draft the Energy Efficiency and Conservation Bill to be tabled in Parliament in 2021.

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

PERANCANGAN PEMBANGUNAN KAPASITI
CAPACITY DEVELOPMENT PLAN

SEMENANJUNG MALAYSIA
PENINSULAR MALAYSIA

Bahan api bagi penjanaan tenaga di Semenanjung Malaysia secara amnya terdiri daripada arang batu, gas dan hidro dengan penambahan secara berperingkat ditumpukan kepada penjanaan TBB.

Pada penghujung 2019, terdapat 54 loji janakuasa dalam sistem rangkaian di Semenanjung - 19 loji janakuasa gas, lapan loji janakuasa arang batu, enam loji janakuasa hidro dan 21 projek LSS. Projek LSS pertama mula berada di dalam sistem pada 2017, diikuti lapan lagi pada 2018. Pada 2019, 12 lagi projek LSS telah ditambahkan kepada sistem, dengan beberapa lagi dijadualkan beroperasi dalam masa beberapa tahun akan datang.

Pembangunan Kapasiti Penjanaan (2020-2030)

Pada 21 November 2019, Pelan Pembangunan Penjanaan Semenanjung Malaysia (2020–2030) telah diluluskan oleh Jawatakuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tariff (JPPPET) yang dipengerusikan oleh YB Menteri Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC).

Pelan ini bagi tujuan untuk memastikan bekalan yang berdaya harap dan terjamin dapat disediakan kepada pengguna pada harga yang berpatutan, disamping berupaya memenuhi aspirasi Kerajaan serta komitmen antarabangsa.

Pelan ini telah dibangunkan berdasarkan unjuran permintaan elektrik dan ekonomi negara. Ciri utama pelan ini adalah untuk mengoptimumkan tahap margin rizab; mengurangkan *loss of load expectation (LOLE)* untuk memastikan penjanaan dan penghantaran adalah selaras dengan daya harap pembekalan; dan mengurangkan skor *Herfindhal-Hirschman Index (HHI)* bagi memastikan kepelbagaian campuran bahan api dan keberterusan bekalan tenaga. *HHI* mengukur kepelbagaian campuran bahan api di mana semakin rendah jumlah, semakin tinggi kepelbagaian bahan api dan keberterusan bekalan tenaga.

Pelan ini juga mengambil kira polisi dan aspirasi Kerajaan seperti peningkatan kapasiti penjanaan TBB kepada 20% menjelang 2025 dan pengurangan sebanyak 35% intensiti pelepasan gas (karbon dioksida per Keluaran Dalam Negeri Kasar - KDNK) menjelang 2030. Perkara-perkara lain yang turut diambilkira dalam pembangunan pelan tersebut termasuk ketersediaan bahan api, teknologi penjanaan dan kemajuan projek-projek talian penghantaran sedia ada.

Berdasarkan pertimbangan-pertimbangan tersebut, pelan ini berperanan menentukan campuran kapasiti, campuran bahan api dan margin rizab yang optimum bagi 10 tahun yang akan datang.

Power generation in Peninsular Malaysia generally comprises of coal, gas and hydro fuel sources with a gradual shift being made towards RE.

As at the end of 2019, there were 54 power plants connected to the network system in the Peninsular – 19 gas plants, eight coal-fired plants, six hydroelectric plants and 21 LSS farms. The first LSS farm entered the system in 2017, followed by eight more in 2018. In 2019, another 12 LSS farms were added, with several more scheduled to come onstream in the next few years.

Generation Capacity Development (2020-2030)

On 21 November 2019, the Peninsular Malaysia Generation Development Plan (2020-2030) was approved by the *Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Electrik dan Tarif (JPPPET)* Committee, chaired by the Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC).

This Plan's objective is to ensure that demand is met by reliable and secure supply of electricity at an affordable cost, while realising the Government's aspirations and international commitments.

The Plan was developed based on the nation's electricity and economic demand forecasts.The highlight of the Plan is to optimise the reserve margin level; to reduce the loss of load expectation (LOLE) so that generation and transmission are synchronised in the interest of supply reliability; and to lower the Herfindhal-Hirschman Index (HHI) score to ensure the diversity of fuel mix and continuous energy supply. HHI measures fuel diversification where the lower the score, the higher the fuel diversification and energy security.

The Plan also took into account of Government policies and aspirations such as increasing RE capacity to 20% by 2025 and a 35% reduction in emission intensity (carbon dioxide per Gross Domestic Product - GDP) by 2030. Other considerations taken into account in developing the Plan were fuel availability, generation technologies and the progress of ongoing transmission projects.

Based on these considerations, the Plan determined the capacity mix, fuel mix and optimum reserve margin for the next 10 years.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Campuran Kapasiti Terpasang

Kapasiti terpasang bagi TBB di Semenanjung Malaysia dijangka akan bertambah daripada 7% pada 2019 kepada 20% menjelang 2025 dan akan kekal pada tahap yang sama sehingga 2030.

Dalam 10 tahun yang akan datang, pengurangan ketara dijangkakan akan berlaku bagi penjanaan berasaskan bahan api fosil, daripada 82% pada 2020 kepada 70% pada 2030. Pengurangan terbesar adalah bagi arang batu, iaitu daripada 42% pada 2020 kepada 35% pada 2025 dan 29% menjelang 2030. Walau bagaimanapun, gas sebagai bahan api fosil yang paling bersih akan terus mendominasi kedudukannya.

Bagi mencapai sasaran 20% kapasiti TBB menjelang 2025, 3,758MW kapasiti TBB perlu dibangunkan di Semenanjung Malaysia bermula dari 2020. Ini merangkumi 2,172MW kapasiti tenaga solar dan 1,586MW kapasiti TBB bukan solar.

Kestabilan sistem grid dijangka kekal terkawal dengan penusukan tenaga solar yang akan berada pada paras 24% daripada jumlah kehendak maksimum menjelang tahun 2025.

Installed Capacity Mix

The installed capacity of RE in Peninsular Malaysia is set to grow from the current 7% in 2019 to 20% by 2025 and remain at this level until 2030.

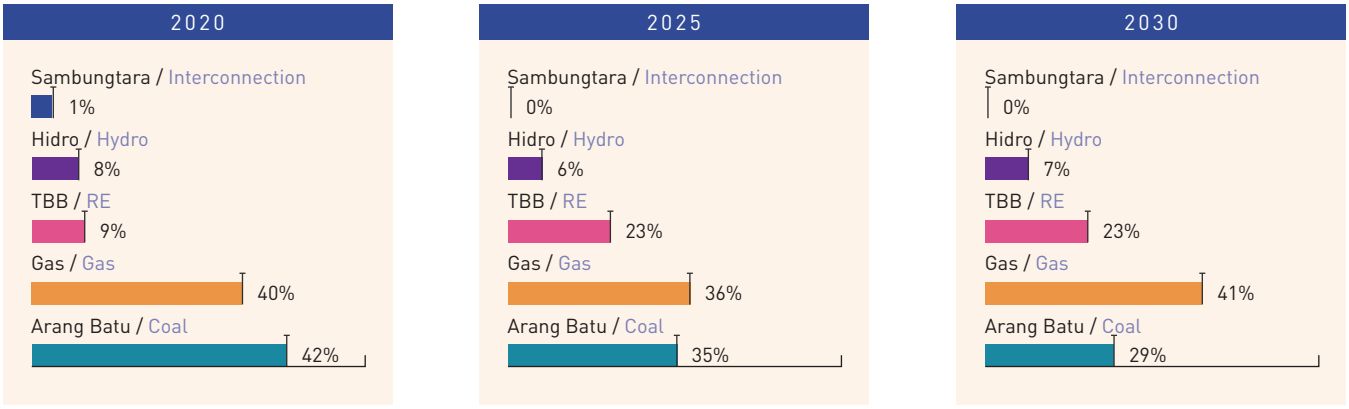
The next 10 years will see a decline in generation using fossil fuels, from 82% in 2020 to 70% in 2030. The biggest fall is in coal, from 42% in 2020 to 35% in 2025 and 29% in 2030. Gas, however, will continue its dominance since it is the cleanest of fossil fuels.

To achieve the 20% RE installed capacity target by 2025, an additional 3,758MW of RE capacity needs to be developed in Peninsular Malaysia beginning 2020. This is to consist of 2,172MW of solar energy and 1,586MW from non-solar RE sources.

The grid system is expected to remain stable with the penetration of solar energy that is estimated to reach 24% of the maximum demand by 2025.

A CAMPURAN KAPASITI / CAPACITY MIX

Campuran Kapasiti diluluskan JPPPET pada 2019
Capacity Mix as approved by JPPPET in 2019



MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Campuran Tenaga

Sementara gas secara puratanya mendominasi campuran kapasiti bagi tempoh sehingga 2030, dari segi campuran kapasiti tenaga, arang batu mendahului penjanaan bahan api yang lain disebabkan unjuran harganya yang lebih rendah berbanding bahan api yang lain, iaitu arang batu pada 47%, berbanding gas pada 35%, 15% TBB dan 3% hidro pada 2030.

Walau bagaimanapun, bahagian arang batu dalam campuran dijangka akan menunjukkan trend yang menurun dalam masa 10 tahun yang akan datang.

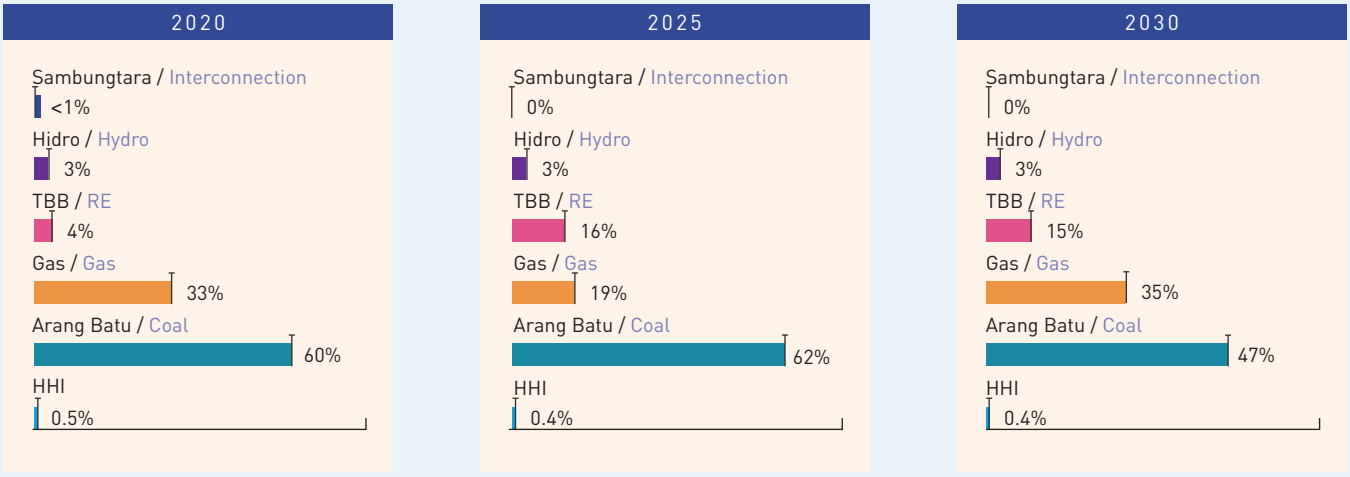
Energy Mix

While gas dominates the capacity mix for the period up to 2030, the energy mix is led by coal due to the expected lower price compared to other fuels. Coal is projected at 47%, compared to 35% gas, 15% RE and 3% hydro in the energy mix in 2030.

Notwithstanding this, the share of coal is set to decline in the next 10 years.

B CAMPURAN TENAGA
ENERGY MIX

Campuran Tenaga yang diluluskan JPPPET pada 2019
Energy Mix as approved by JPPPET in 2019



C MARGIN RIZAB
RESERVE MARGIN

Jumlah kapasiti terpasang di Semenanjung Malaysia berkurangan sebanyak 436.4MW dengan penamatan operasi loji Port Dickson Power pada 28 Februari tahun ini. Pada masa yang sama, sistem grid telah menerima penambahan kapasiti berjumlah 2,450MW daripada penjanaan pepasangan baharu - 250MW dari projek LSS, 200MW dari Pengerang Power dan 2,000MW dari Jimah East Power, menjadikan jumlah keseluruhan kapasiti terpasang di Semenanjung sebanyak 26,132MW.

Dengan rekod permintaan maksimum sebanyak 18,566MW, rizab margin pada 31 Disember 2019 adalah 38%.

Tahun 2021 akan menyediakan peningkatan ketara margin rizab sehingga 48% disebabkan oleh mula tugas loji-loji seperti Southern Power Generation (1,440MW) dan Edra Energy (2,242MW). Margin rizab dijangka akan menurun ke linkungan 20% mulai 2028.

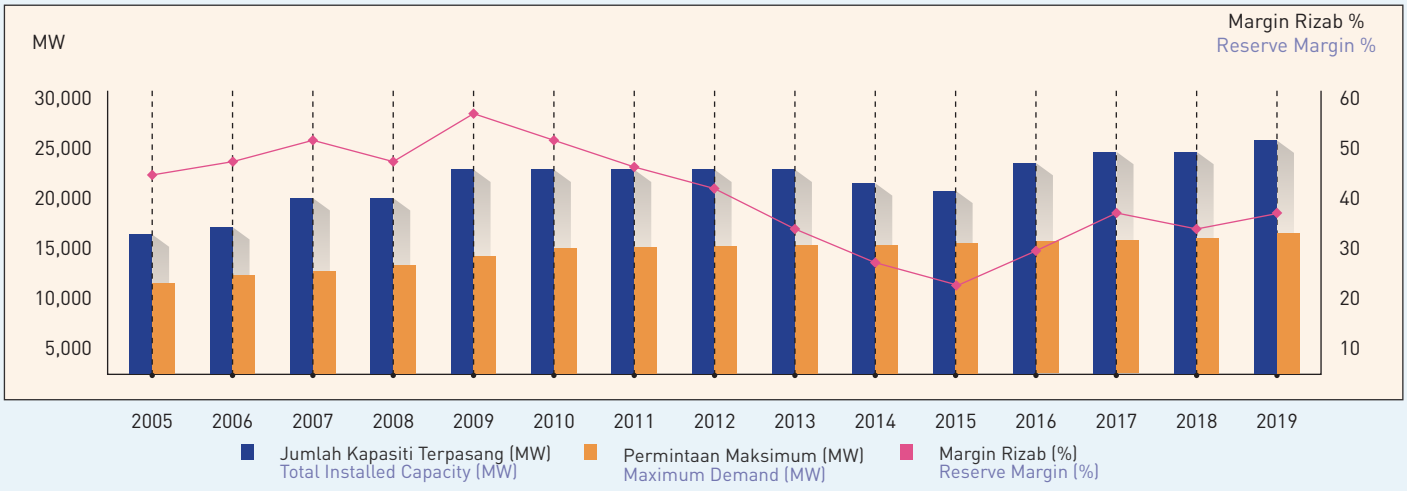
The year 2019 saw the closure of the Port Dickson Power plant on 28 February which spurred the decrease in the total installed capacity in Peninsular Malaysia by 436.4MW. At the same time, the grid system received an additional capacity of 2,450MW generated by new installations – 250MW from LSS, 200MW from Pengerang Power and 2,000MW from Jimah East Power, contributing to an overall total installed capacity of 26,132MW.

With a maximum demand record of 18,566MW, the reserve margin stood at 38% as at 31 December 2019.

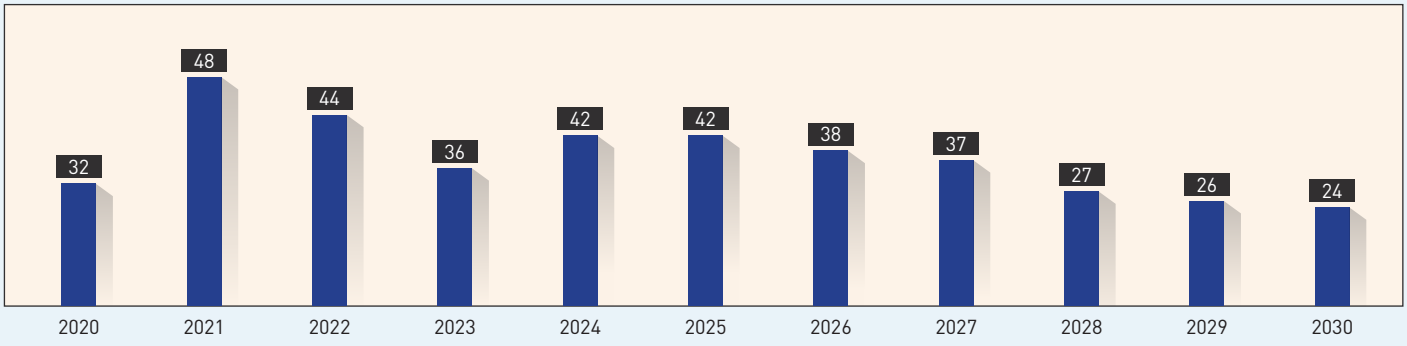
In 2021, there will be a further increase in the reserve margin of up to 48%, contributed by the commissioning of Southern Power Generation (1,440MW) and Edra Energy (2,242MW). The reserve margin is forecast to decline to the 20% range from 2028 onwards.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Trend Margin Rizab di Semenanjung Malaysia, 2005-2019
Reserve Margin Trend for Peninsular Malaysia, 2005-2019



Unjuran Margin Rizab, 2020-2030
Reserve Margin Projection, 2020-2030



SABAH

Penilaian dan kelulusan Pelan Pembangunan Penjanaan Sabah (2020-2030) adalah di bawah bidang kuasa Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tariff Sabah yang dipengerusikan oleh YB Menteri MESTECC dan YAB Ketua Menteri Sabah.

Pelan ini telah diluluskan pada 1 April 2019 disusuli dengan mesyuarat pada 23 April dan 2 Julai, di mana penumpuan diberikan kepada peningkatan rangkaian penghantaran negeri dan meneroka potensi penjanaan baharu, termasuk TBB bagi tempoh 2019 sehingga 2028.

The evaluation and approval of the Sabah Generation Development Plan (2020-2030) comes under the jurisdiction of the State Planning and Implementation of Electricity Supply and Tariffs Committee that is co-chaired by the Minister of MESTECC and the Chief Minister of Sabah.

The Plan was approved on 1 April 2019 with subsequent meetings held on 23 April and 2 July, with focus given to strengthening the state transmission network and exploring the potential for new generation, including RE for the period 2019 to 2028.

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

A CAMPURAN KAPASITI
CAPACITY MIX

Campuran kapasiti di Sabah berbeza dengan Semenanjung Malaysia. Sehingga tahun 2019, ianya masih terlalu bergantung kepada gas (78%), dan selebihnya terdiri daripada diesel/MFO (12%), biomas/biogas (2%), hidro (7%) dan LSS (1%).

Seterusnya, Kerajaan bercadang untuk menggiatkan usaha untuk mempelbagaikan lagi sumber bahan api melalui pelaksanaan penjanaan berasaskan TBB seperti tenaga solar dan hidro. Sumber bahan api baharu melalui sambungtara akan turut diteroka, di mana tenaga akan dibekalkan daripada Sarawak.

Untuk mencapai matlamat ini, pada persidangan pertama bagi mesyuarat JPPPET Sabah pada 23 April, Jawatankuasa telah, pada dasarnya, bersetuju terhadap inisiatif-inisiatif penjanaan seperti berikut:

- Menghentikan operasi kesemua loji janakuasa diesel yang lama atau semakin berusia di Pantai Timur Sabah secara berperingkat, mulai tahun 2021 dan sepenuhnya pada tahun 2024.
- Melancarkan pembekalan tenaga melalui sambungtara Sabah-Sarawak pada tahun 2022, dengan kapasiti awal 50 MW melalui talian penghantaran 275kV Lawas-Mengalong.
- Membangunkan loji janakuasa berasaskan gas untuk menggantikan penjanaan berasaskan bahan api diesel pada tahun 2024 untuk mengurangkan kebergantungan kepada subsidi bahan api gas dan loji janakuasa sedia ada yang kurang cekap.
- Pemulaan tugas loji janakuasa hidro Upper Padas pada tahun 2027 yang akan meningkatkan kapasiti hidro sebanyak 190MW.

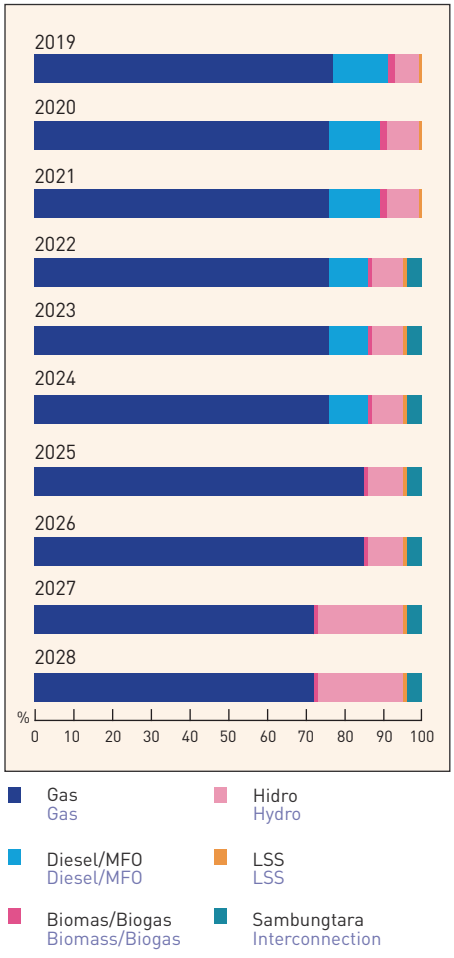
The capacity mix in Sabah differs from that in Peninsular Malaysia. As at 2019, it shows an overdependence on gas (78%), with other fuels such as diesel/MFO (12%), biomass/biogas (2%), hydro (7%) and LSS (1%) making up the balance.

Moving forward, the Government aims to intensify fuel diversification with the implementation of generation from RE based on solar power and hydro. A new fuel source, interconnection, will also be explored, with power supplied by Sarawak.

To achieve this, at the first meeting convened by the Sabah JPPPET on 23 April, the Committee agreed in principle to the following generation initiatives:

- To cease operation of all aged or aging diesel generators in the East Coast of Sabah in stages, beginning 2021 with complete cessation by 2024.
- To initiate power supply via the Sabah-Sarawak interconnection in 2022, with the initial transfer of 50 MW capacity via the 275kV Lawas-Mengalong transmission line.
- To develop gas power plants to replace diesel fuel generation in 2024, and to reduce reliance on gas subsidies and current power plants that are inefficient.
- To operationalise the Upper Padas hydro dam in 2027 that will increase hydro capacity by as much as 190MW.

Campuran Kapasiti yang Diluluskan oleh JPPPET Sabah pada 2019
Capacity Mix as Approved by JPPPET Sabah in 2019



B CAMPURAN TENAGA
ENERGY MIX

Pada ketika ini, Sabah masih lagi menghadapi isu kekurangan bekalan elektrik disebabkan oleh tahap ketersediaan dan daya harap sesetengah stesen janakuasa, terutamanya stesen janakuasa berasaskan diesel.

Pada tahun 2019, bekalan elektrik di Sabah dijana daripada gas (86%), hidro (7%), diesel (4%), biomas/biogas (2%) dan tenaga solar (1%).

Pelan Pembangunan Penjanaan Sabah bertujuan untuk mengurangkan penjanaan bahan api berasaskan gas menjelang 2027. Kekurangan yang dialami akan diambil alih oleh peningkatan dalam penjanaan hidro. Tambahan lagi, loji diesel akan digantikan sepenuhnya dengan loji berasaskan gas yang lebih moden dan cekap menjelang 2024. Ini dijangka dapat meningkatkan kualiti, kemampanan dan daya harap pembekalan.

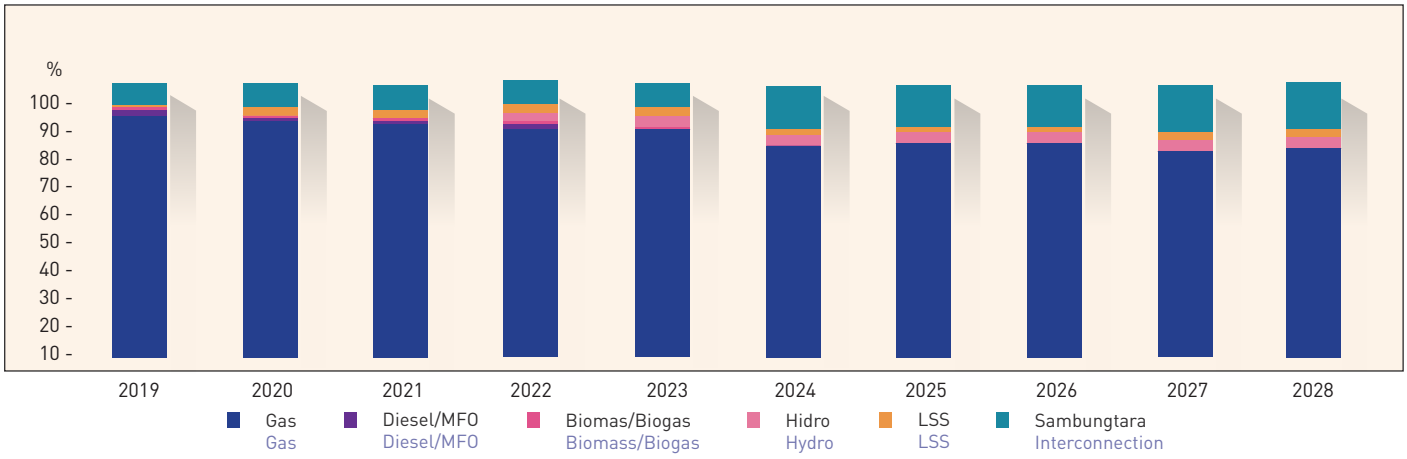
Currently, Sabah's shortage of power supply is largely due to the level of readiness and reliability of some of the power plants, especially diesel-based power stations.

In 2019, the state's electricity supply was generated by gas (86%), hydro (7%), diesel (4%), biomass/biogas (2%) and solar power (1%).

The Sabah Generation Development Plan aims to reduce gas-based fuel generation by 2027. The shortfall caused will be taken up by increased hydro generation. In addition, diesel-based plants will be replaced completely by more modern and efficient gas power plants by 2024. This is expected to improve the quality, sustainability and reliability of supply.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Campuran Tenaga yang Diluluskan oleh JPPPET Sabah pada 2019
Energy Mix as Approved by JPPPET Sabah in 2019



C MARGIN RIZAB
RESERVE MARGIN

Seperti yang ditetapkan JPPPET pada 2019, margin rizab Sabah telah dikekalkan melebihi kadar optimum, iaitu sebanyak 30% pada 2019 dengan penambahan kapasiti dari stesen janakuasa GT Melawa (18 MW) dan rehabilitasi stesen janakuasa Tawau DG (13 MW). Margin rizab diunjur akan naik dengan ketara pada 2025 sebelum menurun ke 26% pada 2026 dan menjadi stabil pada paras optimal menjelang 2028.

Dua projek naik taraf talian penghantaran dan infrastruktur telah dirancang, iaitu projek naik taraf talian penghantaran 275kV Segaliud – Dam Road dan projek 132kV PMU Apas. Kedua-dua talian penghantaran ini akan menyalurkan tenaga dari Pantai Barat ke Pantai Timur Sabah untuk memastikan margin rizab mencukupi, terutamanya di daerah Pantai Timur Sabah.

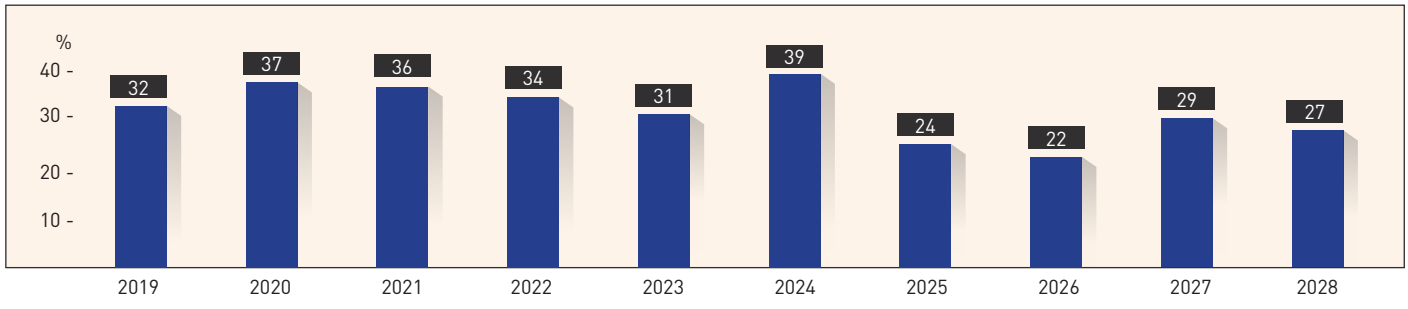
Turut dirancang adalah pembangunan kapasiti penjanaan tambahan sebanyak 100 MW menjelang 2024, bagi menggantikan set penjana diesel sedia ada yang akan tamat pengoperasiannya. Kerajaan juga sedang mengkaji penjanaan alternatif paling sesuai bagi Sabah untuk mengekalkan kecukupan kapasiti dan margin rizab yang optimal iaitu sebanyak 30% sehingga 2030. Margin rizab sistem dijangka berada dalam lingkungan 30% seperti dirancang, namun tertakluk kepada perubahan unjuran hadapan permintaan bekalan elektrik serta kejayaan pelaksanaan projek-projek yang telah komited.

As affirmed by JPPPET in 2019, Sabah's reserve margin was maintained above the optimal rate of 30% in 2019 with the addition of capacity by GT Melawa Power Station (18 MW) and the rehabilitated Tawau DG Power Station (13 MW). The reserve margin is forecast to spike in 2025 before dropping to 26% in 2026 and stabilising to an optimal level by 2028.

Two transmission and infrastructure upgrading projects are planned, namely, the 275kV Segaliud - Dam Road transmission upgrading project and the 132kV Apas PMU Project. These new transmission lines are set to transfer energy from the West Coast to the East Coast of Sabah to ensure there is adequate reserve margin, especially in the East Coast region.

Also planned is the development of 100MW additional generation capacity by 2024, to replace current diesel generation sets that will cease operations. The Government is also currently exploring generation alternatives that will be most appropriate for Sabah to maintain adequate capacity to deliver an optimal reserve margin of 30% up until 2030. The system's reserve margin is expected to be within the 30% range as planned, but this is subject to change with future forecasts for electricity supply demand as well as the successful implementation of committed projects.

Unjuran Margin Rizab, 2019-2028
Reserve Margin Projections, 2019-2028



MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

PROJEK PEMBANGUNAN PENJANAAN DAN PENGHANTARAN BERIMPAK TINGGI
HIGH IMPACT GENERATION AND TRANSMISSION DEVELOPMENT PROJECTS

Semenanjung Malaysia

Demi keberterusan tenaga dan berdasarkan jangkaan permintaan pada masa hadapan, Kerajaan telah memulakan tiga projek penjanaan dan dua projek penghantaran berimpak tinggi yang dianggap kritikal bagi mengekalkan daya harap pembekalan tenaga di Semenanjung Malaysia. Pada akhir 2019, projek-projek penjanaan di Johor (gas), Melaka (gas) dan Kelantan (hidro) telah dilancarkan mengikut jadual.

Projek-projek penghantaran tersebut merupakan sebahagian daripada tulang belakang 500kV yang sedang dalam pembinaan daripada Gurun di utara ke Pasir Gudang di selatan, untuk memudahkan penyaluran tenaga secara pukal antara kawasan bagi memenuhi keperluan perindustrian dan penduduk Lembah Klang dan Kuala Lumpur di Kawasan Tengah.

Peninsular Malaysia

In the interest of energy security and in anticipation of future demand, the Government embarked on three high impact generation projects and two transmission projects deemed critical for the reliable supply of power in the Peninsular. As at end 2019, the generation projects in Johor (gas), Melaka (gas) and Kelantan (hydro) were on track.

The transmission projects are part of the 500kV backbone that is being built from Gurun in the north to Pasir Gudang in the south, to facilitate inter-area bulk power transfer to meet the power needs of the populous and industrialised Central Region, where the Klang Valley and Kuala Lumpur are located.

Kerja Penjanaan dan Penghantaran Sedang Dilaksanakan di Semenanjung Malaysia
Generation and Transmission Works in Progress in Peninsular Malaysia

a. Status Projek Penjanaan
Status of Generation Projects

Bil. Nos.	Projek Project	Lokasi Location	Bahan Api Fuel	Kapasiti Capacity
1	Southern Power Generation Sdn Bhd	Johor	Gas	1,440MW
2	Edra Energy Sdn Bhd	Melaka	Gas	2,242MW
3	HEP Nenggiri*	Kelantan	Hydro	300MW

Kemajuan Pembangunan Southern Power Generation Sdn Bhd (April 2019)
Southern Power Generation Sdn Bhd Site Progress (April 2019)

Kemajuan Pembangunan Edra Energy Sdn Bhd (April 2019)
Edra Energy Sdn Bhd Site Progress (April 2019)

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

b. Status Projek Penghantaran
Status of Transmission Projects

1

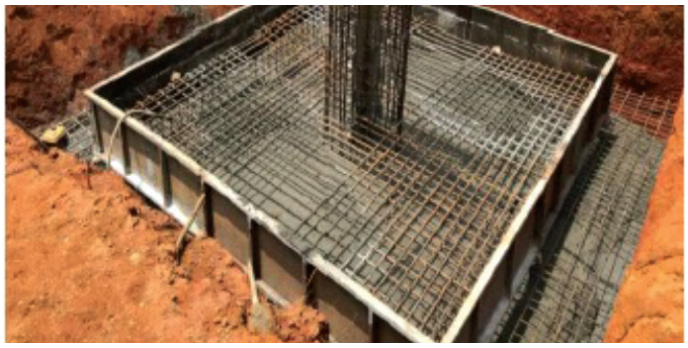
500kV OHL Ayer Tawar-Bentong South
- Titik X- Titik Y

500kV OHL Ayer Tawar-Bentong South
- Point X- Point Y

2

500kV OHL Bentong South-Lenggeng
- BNTS - Titik Z
- Titik Z - Titik M

500kV OHL Bentong South-Lenggeng
- BNTS - Point Z
- Point Z - Point M



500kV OHL Ayer Tawar-Bentong South

500kV OHL Bentong South-Lenggeng

Sabah

Status Projek Penjanaan

Di Sabah, Kerajaan sedang membangunkan empat loji janakuasa berimpak tinggi di bawah Rancangan Malaysia Ke-11 (2016-2020) untuk memenuhi permintaan tenaga di kawasan berpopulasi tinggi di Pantai Timur seperti Sandakan dan Tawau yang merupakan bandar yang kedua dan ketiga terbesar di Sabah.

Sabah

Status of Generation Projects

In Sabah, the Government is developing four high impact power plants under the 11th Malaysia Plan (2016-2020) to meet the demand for power in the East Coast population centres of Sandakan and Tawau, the second and third largest towns in Sabah.

a. Status Projek Penjanaan
Status of Generation Projects

Bil. Nos.	**Projek** Project	**Lokasi** Location	**Bahan Api** Fuel	**Kapasiti** Capacity
1	Penempatan semula GT Melawa GT Melawa Relocation	Sandakan	Diesel	18MW
2	Rehabilitasi SJ Tawau SJ Tawau Rehabilitation	Tawau	Diesel	13MW
3	Tawau Canopy	Tawau	Diesel	11MW
4	Rehabilitasi Gantisan Gantisan Rehabilitation	Sandakan	Diesel	36MW

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Status Projek Penghantaran

Di Sabah, penumpuan telah diberi kepada pengukuhan rangkaian yang sedia ada untuk memastikan daya harap pembekalan tenaga, pengurangan gangguan dan juga bagi memenuhi keperluan penambahan beban pada masa akan datang. Untuk mencapai matlamat ini, tujuh projek telah dilaksanakan.

Status of Transmission Projects

In Sabah, the focus is on strengthening the existing network to ensure reliable power supply, reduce disruptions and cater to future load growth. To achieve this, seven projects were implemented.

Bil. Nos.	Projek Project		
1	275kV Segaliud – Dam Road	5.	PMU & PPU Bukit Nenas
2	132kV Segaliud – Seguntor	6.	275kV Kimanis - Mengalong
3.	New Line 132kV (Sandakan – Elopura – Seguntor)	7.	275kV Mengalong - Lawas
4.	132kV Apas		

TENAGA BOLEH BAHARU
RENEWABLE ENERGY

Kemampanan tenaga Malaysia tertumpu kepada penambahan TBB dalam campuran kapasiti serta bahan apinya. Berdasarkan matlamat ini, Kerajaan telah memperkenalkan program LSS dalam Rancangan Malaysia ke-11 (2016-2020).

Program LSS ini adalah bertujuan untuk mempercepatkan peningkatan kapasiti penjanaan TBB di Malaysia. Pada awalnya tempoh pelaksanaan program ini merangkumi tiga pusingan, kemasukan LSS secara berperingkat ke dalam grid, bermula 2017 hingga 2020. Sejak itu program LSS telah diperkembangkan kepada peringkat seterusnya, yang melibatkan kapasiti LSS baharu bagi 2020 sehingga 2025. Ini bagi membolehkan ST, yang telah dimandatkan untuk melaksanakan program ini, untuk memantau prestasi teknikal projek-projek LSS dan impaknya ke atas pasaran.

Pembidaan syarikat-syarikat yang berkelayakan dijalankan secara kompetitif.

Loji LSS mula beroperasi buat pertama kalinya pada tahun 2017. Pada 2018, lapan lagi loji LSS telah ditambah, diikuti dengan 12 lagi loji LSS pada tahun 2019. Kini, terdapat 21 loji LSS dalam negara, dengan beberapa lagi dijadualkan mula beroperasi dalam tahun-tahun akan datang.

Kapasiti LSS akan bertambah dengan ketara apabila projek-projek yang sedang dalam pembinaan mula beroperasi, yang seterusnya akan mendapatkan pencapaian sasaran 20% TBB menjelang 2025, bagi Semenanjung Malaysia.

Malaysia's energy sustainability is focused on increasing the share of RE in the capacity and fuel mix. To this end, the Government introduced the LSS programme under the 11th Malaysia Plan (2016-2020).

The LSS programme aims to accelerate the growth of Malaysia's RE production capacity. It initially covered three cycles, from 2017 to 2020, for the staggered inclusion of LSS into the grid. The LSS programme has since been expanded to the next stage involving new LSS capacity planned for 2020 until 2025. This will also enable the Commission, which is entrusted with the implementation of the programme, to monitor the technical performance of LSS projects and their impact on the market.

The Commission conducts competitive bidding cycles for the participation of qualified companies.

LSS started operating for the first time in 2017. In 2018, eight more were added, followed by another 12 LSS projects in 2019. With this, there are 21 LSS projects in the country, with several more scheduled to come onstream in the next few years.

There will be a marked increase in LSS capacity when projects currently under construction become operational, bringing Peninsular Malaysia closer to achieving its 20% by 2025 RE target.

Loji LSS
LSS Plants

21 Projek
Projects
Mula Beroperasi
Commenced Operations

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Pusingan Pembidaan

Terdapat tiga pusingan pembidaan, di mana sebanyak 1,448.76MW kapasiti TBB telah dianugerahkan kepada 63 syarikat untuk menjalankan operasi komersial loji LSS.

Sebanyak 400.90MW telah dianugerahkan kepada 18 buah syarikat pada pusingan pembidaan pertama yang beroperasi secara komersial pada 2017 ke 2018; 15 projek bertempat di Semenanjung Malaysia dan tiga di Sabah. Pada akhir 2019, 12 daripada projek-projek ini, dengan jumlah kapasiti sebanyak 342.50MW telah mula beroperasi. Kesemua projek di Semenanjung Malaysia di bawah Pusingan Pembidaan Pertama ini telah siap dilaksanakan.

Pusingan Pembidaan Kedua pada 2019-2020 telah memperlihatkan sebanyak 556.99MW dianugerahkan kepada 40 buah syarikat; 30 projek bertempat di Semenanjung Malaysia dan 10 lagi di Sabah. Pada akhir 2019, empat projek dengan kapasiti sebanyak 35.87MW telah mula beroperasi dengan 23 lagi projek sedang dalam pembangunan.

Pada 14 Februari 2019, Pusingan Pembidaan Ketiga di Semenanjung Malaysia telah dimulakan. Lima syarikat telah dianugerahkan dengan jumlah kapasiti LSS sebanyak 490.88MW. Penganugerahan ini telah dimuktamadkan pada Disember, 2019 melalui pengeluaran *Letter of Acceptance of Offer* kepada syarikat-syarikat yang telah disenarai pendekkan.

Jadual di bawah menyenaraikan lima syarikat dengan penganugerahan jumlah kapasiti LSS masing-masing di bawah Pusingan Pembidaan Ketiga.

Bidding Cycles

There have been three bidding cycles, during which 1,448.76MW RE capacity was awarded to 63 companies to establish LSS farms for commercial operations.

The first bidding cycle in 2017 to 2018 saw 400.90MW awarded to 18 companies; 15 were based in Peninsular Malaysia and the remaining three were in Sabah. As at end 2019, 12 of these projects with a total capacity of 342.50MW had commenced operations. All projects in Peninsular Malaysia under Bidding Cycle 1 have been completed.

The Second Bidding Cycle in 2019-2020 saw the award of 556.99MW capacity to 40 companies; 30 of them were based in Peninsular Malaysia and 10 in Sabah. As at end 2019, four projects with a capacity of 35.87MW had commenced operations and 23 projects are under development.

On 14 February 2019, the Third Bidding Cycle for Peninsular Malaysia began. Five companies were awarded a total LSS capacity of 490.88MW. The award was finalised on December, 2019 with the issuance of Letters of Acceptance of Offer to the short listed companies.

The table below lists the five companies and LSS capacity awarded under the Third Bidding Cycle.

Bil. Nos.	**Syarikat** Company	**Kapasiti (MW)** Capacity (MW)	**Lokasi** Location
1	ib vogt GmbH & Coara Solar Sdn Bhd	100.00	Marang, Terengganu
2	Cypark Resources Berhad & Impian Bumiria Sdn Bhd	100.00	Marang, Terengganu
3	JKH Renewables Sdn Bhd & Solarpack Asia Sdn Bhd	90.88	Kuala Muda, Kedah
4	ENGIE Energie Services S.A. & TTL Energy Sdn Bhd	100.00	Kerian, Perak
5	Konsortium Beseri Jaya Sdn Bhd & Hanwha Energy Corporation Singapore Pte. Ltd.	100.00	Pekan, Pahang

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

KECEKAPAN TENAGA
ENERGY EFFICIENCY

Kerajaan telah memberi keutamaan kepada kecekapan tenaga selaras dengan permintaan yang terus meningkat selari dengan pertumbuhan populasi dan perindustrian yang pesat.

Untuk menggalakkan tadbir urus yang baik dalam amalan pengurusan tenaga di kalangan pengguna kuasa besar, Kerajaan telah menguatkuasakan Peraturan Pengurusan Tenaga Elektrik Dengan Cekap (PPTEC) pada tahun 2008. Pada tahun 2016, Pelan Tindakan Kecekapan Tenaga Nasional (NEEAP) mula dilaksanakan dan telah memperkenalkan pelbagai inisiatif kecekapan tenaga elektrik bagi kesemua pengguna.

NEEAP meliputi tempoh daripada 2016 ke 2020. Melalui pelaksanaan inisiatif-inisiatif PPTEC dan NEEAP, Malaysia telah mencapai penjimatan tenaga sebanyak 2.08% pada 2019.

Intensiti Elektrik

ST memantau intensiti elektrik iaitu ukuran jumlah elektrik yang diperlukan untuk menghasillan satu unit Keluaran Dalam Negara Kasar (KDNK). Semakin rendah intensiti, semakin cekap penjanaan dan penggunaan tenaga.

Sepanjang 2019, intensiti elektrik tahunan di Semenanjung Malaysia direkodkan pada 0.0988 GWj/RM juta (2018: 0.1005 GWj/RM juta). Ini merupakan pengurangan sebanyak 1.69% berbanding tahun sebelumnya. Di Sabah pula intensiti elektrik direkodkan pada 0.0538 GWj/RM juta (2018: 0.0538 GWj/RM juta).

Sebahagian besar pengurangan ini adalah melalui usaha pemantauan ketat terhadap pengguna-pengguna kuasa besar, terutamanya bagi sektor pengilangan dan perkhidmatan.

The Government has made energy efficiency a priority as demand continues to rise in tandem with population growth and rapid industrialisation.

To encourage good governance in energy management practices among large power consumers, the Government enforced the Efficient Management of Electrical Energy Regulation (EMEER) in 2008. In 2016, the National Energy Efficiency Action Plan (NEEAP), took effect and introduced various electrical energy efficiency initiatives targeting consumers across the board.

NEEAP covers the period from 2016 to 2020. With the implementation of EMEER and NEEAP initiatives, Malaysia has achieved energy savings of 2.08% in 2019.

Electricity Intensity

The Commission monitors electrical intensity that measures the amount of electricity required to generate one unit of Gross Domestic Product (GDP). The lower the intensity, the more efficient the generation output and energy consumption.

In 2019, the annual electricity intensity in Peninsular Malaysia stood at 0.0988 GWh/RM million (2018: 0.1005 GWh/RM million). This is a reduction of 1.69% compared to the previous year. In Sabah, the electricity intensity was 0.0538 GWh/RM million (2018: 0.0538 GWh/RM million).

These reductions are largely due to the monitoring of large power consumers, especially those in the manufacturing and services sector.

Penjimatan Tenaga

Jumlah penjimatan tenaga elektrik semakin meningkat dengan pelaksanaan inisiatif-inisiatif PPTEC dan NEEAP. Sepanjang 2019, inisiatif-inisiatif yang dilaksanakan di bawah NEEAP berjaya mencapai penjimatan tenaga elektrik sebanyak 2,714.38 GWj.

Antara 2016 dan 2019, jumlah penjimatan tenaga secara kumulatif adalah sebanyak 7,616 GWj. Dalam kadar peratusan pula, jumlah penjimatan telah meningkat daripada 0.74% pada 2016 ke 2.08% pada 2019 (2018: 1.80%).

Energy Savings

The total electricity energy savings is on the uptrend with the implementation of EMEER and NEEAP initiatives. In 2019, the initiatives implemented under NEEAP achieved 2,714.38 GWh electrical energy savings.

Between 2016 and 2019, there was a total energy savings of 7,616 GWh. In percentage terms, total savings grew from 0.74% in 2016 to 2.08% in 2019 (2018: 1.80%).

Intensiti Elektrik (GWj/RM juta)
Electricity Intensity (GWh/RM million)

	S1 2019 Q1 2019	S2 2019 Q2 2019	S3 2019 Q3 2019	S4 2019 Q4 2019	TAHUNAN ANNUAL
Semenanjung Malaysia Peninsular Malaysia	0.1004	0.1038	0.0978	0.0937	0.0988
Sabah	0.0543	0.0570	0.0526	0.0515	0.0538

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Pelaksanaan NEEAP

NEEAP adalah pelan tindakan nasional yang komprehensif yang merangka pelbagai inisiatif kecekapan tenaga elektrik untuk pengguna-pengguna industri, komersial dan domestik. Sasarannya adalah untuk mencapai pengurangan keseluruhan pengunaan tenaga sehingga 8% dalam masa 10 tahun.

Pelan Tindakan ini bertujuan untuk mengukuhkan kemampanan pembekalan tenaga Malaysia di samping menyumbang kepada aspirasi Kerajaan untuk mengurangkan tahap pelepasan gas karbon dalam negara. Pelan ini bertujuan untuk memupuk budaya cekap tenaga di kalangan rakyat Malaysia bagi meningkatkan kadar penjimatan tenaga, di samping melindungi sumber tenaga negara.

NEEAP telah berjaya mencapai penjimatan sebenar yang lebih tinggi daripada yang dirancang. Sepanjang 2019, penjimatan yang dilaporkan berdasarkan pemantauan ST adalah sebanyak 2,714.38 GWj; ini merupakan 2.08% lebih tinggi daripada unjuran asal iaitu sebanyak 1.8% dalam Pelan.

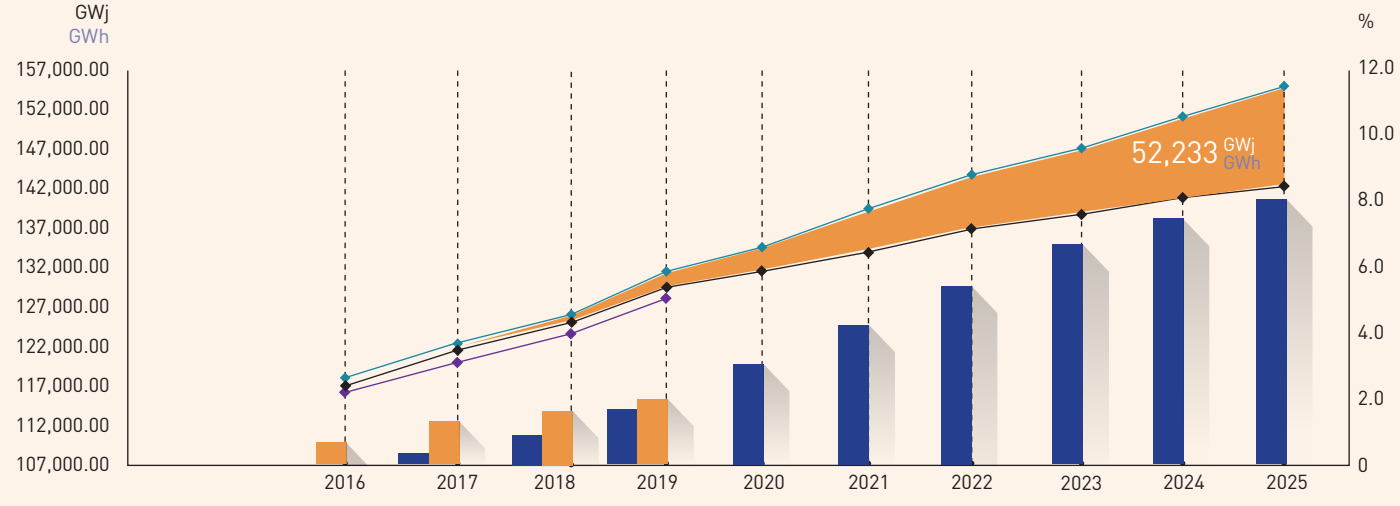
Implementation of NEEAP

NEEAP is a comprehensive national action plan that envisions wide ranging electrical energy efficiency initiatives for industrial, commercial and domestic consumers. The target is to achieve an overall reduction in power consumption by up to 8% in 10 years.

This action plan aims to strengthen the sustainability of Malaysia's energy supply as well as contribute to the Government's aspiration to reduce carbon emissions in the country. The plan aims to instill the energy efficiency culture among Malaysians, to increase the rate of energy savings, and by so doing, safeguard the nation's energy resources.

NEEAP has achieved actual savings that are higher than planned. In 2019, the reported savings based on monitoring by the Commission was 2,714.38 GWh; this is 2.08% higher than the 1.8% projected by the Plan.

Pelan Tindakan Kecekapan Tenaga Nasional (NEEAP), 2016-2025
National Energy Efficiency Action Plan (NEEAP), 2016-2025



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
% Rancangan Penjimatan / % NEEAP Savings Plan	0.1	0.3	0.9	1.8	2.8	3.9	5.0	6.1	7.1	8.0
% Impak Sebenar NEEAP / % Actual NEEAP Impact	0.74	1.46	1.80	2.08						
BAU (Bisnes Seperti Biasa) (GWj) / BAU (Business As Usual) (GWh)	117,100.00	121,431.00	125,885.00	130,474.00	134,830.00	139,206.00	143,326.00	146,991.50	150,657.00	154.142.00
NEEAP Unjuran (GWj) / NEEAP Projection (GWh)	117,022.82	121,045.12	124,784.35	128,188.22	131,046.79	133,730.77	136,164.99	138,082.36	140,003.55	141,750.89
Impak Sebenar NEEAP (GWj) / Actual NEEAP Impact (GWh)	116,244.39	119,661.63	123,618.29	127,759.62						

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Di bawah Rancangan Malaysia ke-11 (2016-2020), sebanyak RM165 juta telah diperuntukkan di bawah NEEAP bagi melaksanakan program-program tertentu untuk memantau penjimatan elektrik secara berterusan. Pada akhir 2019, program-program berikut adalah dalam perlaksanaan:

Under the 11th Malaysia Plan (2016-2020), the NEEAP was allocated RM165 million to implement specific programmes to continuously monitor electricity savings. As at end 2019, the following programmes were ongoing:

1

Program Geran Audit Tenaga Bersyarat (EACG) dalam Sektor Industri

Energy Audit Conditional Grant (EACG) Programme for the Industrial Sector

2

Program Geran Audit Tenaga Bersyarat (EACG) dalam Sektor Bangunan Komersial

Energy Audit Conditional Grant (EACG) Programme for the Commercial Building Sector

3

Program Kecekapan Tenaga untuk Bangunan Kerajaan

Energy Efficiency Programme for Government Buildings

Program Geran Audit Tenaga Bersyarat (EACG) bagi Sektor Industri & Bangunan Komersial

Pengguna besar tenaga di negara ini, setakat akhir 2019, adalah sektor industri dan komersial. Untuk mengurangkan penggunaan tenaga oleh sektor-sektor berkenaan, Rancangan Malaysia ke-11 telah memperuntukkan dana di bawah program EACG untuk sektor perindustrian dan komersial. Program EACG telah memasuki tahun akhir pelaksanaan pada 2019 dan ia akan berakhir dengan Rancangan Malaysia ke-11 pada 2020.

ST adalah koordinator program EACG, yang dilaksanakan bersama-sama Malaysian Green Technology Corporation (MGTC) dan Sustainable Energy Development Authority (SEDA).

Di bawah program EACG, pemilik bangunan industri dan komersial yang memohon geran khas ini dikehendaki melaksanakan langkah-langkah penjimatan tenaga yang dikenalpasti melalui hasil audit pada kos yang sama atau melebihi geran yang diberi.

Di antara 2016 dan 2019, sebanyak RM21.02 juta telah disalurkan di bawah program EACG.

Pelaksanaan dan Impak Program EACG

Program EACG dibahagikan kepada dua komponen. Komponen 1 (2016-2017) tertumpu kepada pemilihan pemohon-pemohon geran. Sebanyak 307 permohonan telah diterima, dan 217 telah dipilih untuk menerima geran khas ini. Kesemua penerima geran telah selesai melakukan audit tenaga pada 2018.

Energy Audit Conditional Grant (EACG) Programme for Industrial & Commercial Building Sectors

The industrial and commercial sectors account for a large amount of energy consumption in the country. To reduce their power consumption, the 11th Malaysia Plan allocated funds under the EACG programme for the industrial and commercial sectors. In 2019, the EACG programme entered the final year of implementation; it will end with the 11th Malaysia Plan in 2020.

The Commission is the coordinator of the EACG programme, which is jointly implemented by the Malaysian Green Technology Corporation (MGTC) and the Sustainable Energy Development Authority (SEDA).

The EACG programme requires industrial and commercial building owners to apply for this special grant and implement energy saving measures identified by their energy audit findings at an equal cost or more than the cost of the grant given to them.

Between 2016 and 2019, RM21.02 million had been disbursed under the EACG programme.

Implementation and Impact of the EACG Programme

The EACG programme is divided into two components. Component 1 (2016-2017) focused on selecting applicants for the grant. A total of 307 applications were received, and 217 obtained the special grant. All grant recipients had completed the energy audit by 2018.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Program EACG, Komponen 1
EACG Programme, Component 1

Aktiviti Activity	**Industri** Industry	**Komersial** Commercial
Jumlah Permohonan Total Applications	138	169
Permohonan yang dibuat kepada Jawatankuasa Pemandu Applications to the Steering Committee	126	137
Permohonan Ditolak* Rejected Applications*	12	32
Pemohon yang Menarik Diri Withdrawal by Applicants	18	28
Jumlah Audit Tenaga yang Selesai Number of Audits Completed	108	109

*Nota: *Permohonan ditolak kerana permohonan tidak lengkap*
*Note: *Applications rejected due to incomplete submissions*

Komponen 2 (2018-2020) tertumpu kepada pemantauan pelaksanaan langkah-langkah penjimatan tenaga setahun selepas kumpulan pertama pemohon geran EACG selesai menjalankan aktiviti audit tenaga masing-masing. Sebanyak 157 laporan telah dikemukakan melalui portal atas talian *Energy Management Information System* (EMIS) (2018: 144 laporan). Berdasarkan laporan berkala setiap enam bulan, ST telah mengenalpasti sebanyak 997 langkah-langkah penjimatan tenaga telah dilaksanakan oleh kedua-dua sektor industri dan komersial.

Di antara langkah-langkah yang diambil adalah pemasangan sistem lampu yang lebih cekap, peningkatan pengawalan operasi, program kesedaran dan sistem penyaman udara yang lebih cekap. Langkah-langkah ini telah menyumbang kepada penjimatan tenaga yang cukup besar. Setakat akhir 2019, anggaran penjimatan tenaga tahunan telah mencecah 136 juta kWj, iaitu bersamaan dengan penjimatan bil elektrik sebanyak RM54 juta.

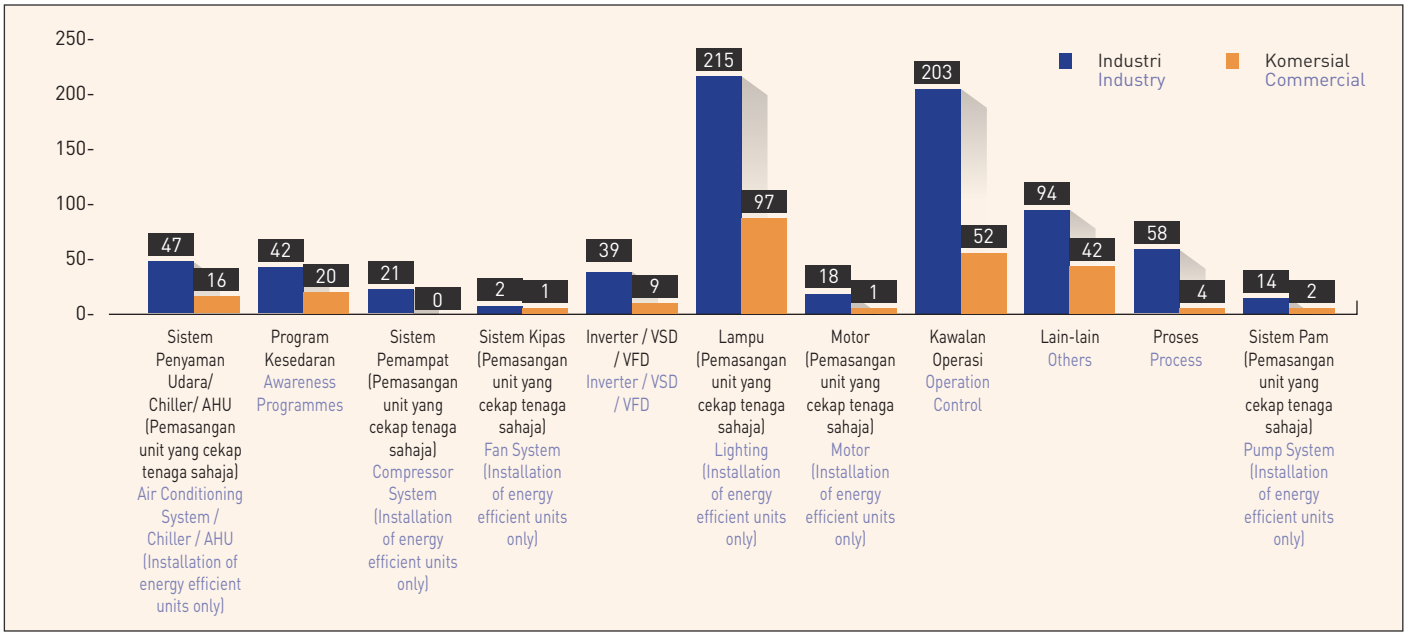
Component 2 (2018-2020) is focused on monitoring energy saving measures implemented one year after the first batch of EACG participants completed their energy audit. A total of 157 reports were submitted on the Energy Management Information System (EMIS) online portal (2018: 144 reports). Based on their periodic six monthly reports, the Commission identified 997 energy saving measures being implemented by both the industrial and commercial sectors.

Among the measures taken were the installation of more efficient lighting systems, improvements to operation control, awareness programmes and more efficient air conditioning systems. These measures resulted in substantial energy savings. As at end 2019, the estimated annual energy savings was almost 136 million kWh, which is equivalent to about RM54 million saved in electricity bills.

Laporan EACG yang Dikemukakan, 2018 dan 2019
EACG Reports Submitted, 2018 and 2019

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Pelaksanaan Langkah Penjimatan Tenaga di bawah EACG sehingga 2019
Energy Saving Measures Implemented under EACG as at 2019



Anggaran Penjimatan melalui Program EACG, sehingga 2019
Estimated Savings Achieved through EACG Programme, as at 2019

Sektor Sector	**Penjimatan Tenaga Tahunan (kWj)** Annual Energy Savings (kWh)	**Anggaran Penjimatan Kos (RM) berdasarkan Tarif Asas*** Estimated Cost Savings (RM) based on Base Tariff*
Industri Industry	117,054,652.72	46,178,060.50
Komersial Commercial	18,732,246.25	7,389,871.15

**Tarif asas: RM0.3945/kWj*
Base tariff: RM 0.3945/kWh

Program Kecekapan Tenaga untuk Bangunan Kerajaan

Di bawah Rancangan Malaysia ke-11, 10 bangunan Kerajaan dan sembilan hospital Kerajaan telah diubahsuai sementara 10 lagi hospital dijangka selesai menggantikan *chiller* menjelang 2020.

Inisiatif ini akan menyumbang kepada jumlah penjimatan sebanyak 13.9 juta kWj, bersamaan dengan RM5.5 juta dengan pengurangan karbon dioksida (ktCO2eq) sebanyak 14.31 kilo tan.

Energy Efficiency Programmes for Government Buildings

Under the 11th Malaysia Plan, 10 Government buildings and nine Government hospitals were retrofitted while another 10 more hospitals are expected to have chiller replacements by 2020.

This initiative will contribute a total savings of 13.9 million kWh, equivalent to RM5.5 million with 14.31 kilo tonnes of carbon dioxide (ktCO2eq) reduction.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Pelaksanaan PPTEC 2008

Sektor industri merupakan pengguna tenaga elektrik terbesar, dan menyumbang hampir separuh daripada penggunaan tenaga negara. Salah satu matlamat utama PPTEC 2008 adalah untuk memastikan tadbir urus yang baik dalam amalan pengurusan tenaga di kalangan pengguna kuasa besar, iaitu pengguna yang menggunakan tenaga elektrik menyamai atau melebihi 3GWj dalam tempoh enam bulan berturut-turut.

Sepanjang 2019, terdapat 1,968 pepasangan yang tertakluk kepada PPTEC 2008 yang menggunakan tenaga elektrik sebanyak 43,653 GWj.

Penjimatan berdasarkan pelaksanaan langkah penjimatan tenaga yang dilaporkan oleh pepasangan adalah 741.76 GWj.

Di antara langkah-langkah yang diambil adalah penukaran sistem lampu pendarfluor kepada lampu LED, penggunaan motor yang lebih cekap tenaga, menetapkan suhu sistem penyaman udara pada 24ºC dengan penarafan bintang yang lebih tinggi.

Perbincangan berkala bersama-sama kakitangan turut diadakan bagi meningkatkan budaya cekap tenaga.

Audit Pematuhan PPTEC 2008

ST melakukan Audit Pengurusan Tenaga tahunan untuk memastikan pengguna kuasa besar melaksanakan langkah-langkah penambahbaikan dan pembetulan di pelbagai peringkat untuk mengurangkan penggunaan tenaga. Sepanjang 2019, ST telah melawat 55 pepasangan. Audit ini juga merangkumi pemantauan terhadap keperluan melantik Pengurus Tenaga Elektrik Berdaftar (PTE) yang perlu dilantik oleh pihak pepasangan. PTE adalah bertanggungjawab untuk memeriksa dan mengesahkan laporan-laporan yang dikemukakan kepada ST mengikut jadual yang ditetapkan.

Pematuhan kepada PPTEC 2008

Hasil daripada aktiviti Audit di bawah PPTEC 2008 serta pemantauan dan penguatkuasaan yang dilakukan oleh ST, pematuhan kepada PPTEC 2008 telah meningkat dengan ketara. Pada 2019, kadar pematuhan telah meningkat kepada 71% iaitu pematuhan di 1,387 pepasangan (2018: 1,311 pepasangan pada kadar pematuhan sebanyak 67%).

Terdapat juga peningkatan bilangan PTE yang perlu berdaftar dengan ST. Pada 2019, bilangan PTE telah meningkat sebanyak 12.92% kepada 1,269 berbanding 1,105 pada 2018, iaitu penambahan seramai 164 PTE baharu sepanjang 2019.

Implementation of EMEER 2008

The industrial sector is the largest consumer of electricity, accounting for about half of the energy consumption in the country. A key goal of EMEER 2008 is to enforce good governance in energy management practices among large power consumers, that is, consumers that utilise equal or more than 3GWh of electricity for a period of six consecutive months.

In 2019, there were 1,968 installations subject to EMEER 2008 that consumed 43,653 GWh of electricity.

The savings reported by these installations based on the energy saving measures implemented was 741.76 GWh.

Among the measures taken were the conversion of fluorescent lighting systems to LED bulbs, the use of more energy-efficient motors, air conditioning systems set at 24ºC with higher star rating.

Regular talks were also conducted for staff members to improve their energy efficiency culture.

EMEER 2008 Compliance Audit

The Commission conducts annual Energy Management Audits to ensure large power consumers are implementing enhancement and corrective measures at various levels to reduce consumption. In 2019, the Commission visited 55 installations. The audits also include monitoring Registered Electrical Energy Managers (REEM) that these installations are required to appoint. REEM are tasked to inspect and verify reports submitted to the Commission on a scheduled basis.

Compliance with EMEER 2008

As a result of the Commission's EMEER 2008 audits, monitoring and enforcement activities, there has been a marked increase in the compliance of EMEER 2008. In 2019, the compliance rate increased to 71%, which represents compliance by 1,387 installations (2018: 1,311 installations, with 67% compliance rate).

There was also a rise in the number of REEM, who are required to be registered with the Commission. In 2019, their numbers grew 12.92%, to 1,269 REEM compared to 1,105 in 2018. This represents an addition of 164 new REEM during 2019.

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Intensiti Tenaga Bangunan

Pada 12 April 2019, Kerajaan telah meluluskan supaya lebih daripada 100 bangunan kerajaan diberi pelabelan prestasi Intensiti Tenaga Bangunan (BEI), iaitu suatu penanda aras antarabangsa untuk mengukur prestasi penggunaan tenaga di sesebuah bangunan. Melalui pelabelan ini, bangunan kerajaan menjadi lebih peka terhadap penggunaan tenaga dan akan berusaha untuk menambahbaik penggunaan tenaga di bangunan masing-masing.

Pelaksanaan BEI adalah kebiasaan di kebanyakan negara-negara maju bagi menggalakkan pemilik bangunan mengoptimumkan tahap penggunaan tenaga dalam bangunan masing-masing serta melaksanakan langkah-langkah penggunaan tenaga secara cekap.

Di Malaysia, Kerajaan telah mengambil langkah awal untuk memastikan pelabelan BEI dilaksanakan di semua bangunan kerajaan. Di samping mengurangkan penggunaan tenaga, langkah-langkah kecekapan tenaga yang dilaksanakan akan turut menghasilkan penjimatan bil elektrik yang ketara.

Pelaksanaan Pelabelan Prestasi BEI

Fasa pertama pelabelan prestasi BEI bermula pada suku keempat 2018 dan melibatkan 25 kementerian dan 52 blok bangunan. Data terkumpul telah digunakan untuk mengukur penggunaan tenaga di setiap kementerian termasuk Pejabat Perdana Menteri, Perdana Putra. Kementerian bersama-sama ST, akan seterusnya mengesyorkan inisiatif-inisiatif bagi meningkatkan prestasi tenaga dan penarafan bintang bagi setiap bangunan.

Perancangan dan pelaksanaan Pelabelan Prestasi BEI ke atas 5,000 bangunan Kerajaan dijangka berlangsung dalam tempoh lapan tahun.

Building Energy Intensity

On 12 April 2019, the Government gave approval for more than 100 public buildings to be labelled under the Building Energy Intensity (BEI), a benchmark to measure the energy consumption performance of buildings. With this, public buildings will become more energy conscious and strive for improvements in energy consumption.

The implementation of BEI is common in many developed countries that encourage building owners to optimise the level of energy use in their buildings as well as implement energy efficient measures.

In Malaysia, the Government took the first step with the BEI labelling of all public buildings. Besides reducing consumption, their energy efficiency measures will also result in substantial savings in energy bills.

Implementation of BEI Performance Labelling

The first phase of the BEI Performance Labelling began in the fourth quarter of 2018 and involved 25 ministries with 52 building blocks. Data gathered was used to measure energy use in each ministry including the Prime Minister's Office, Perdana Putra. The Ministry, together with the Commission, will then advise on initiatives to improve the energy performance and star rating of these buildings.

The planning and implementation of BEI Performance Labelling of 5,000 Government buildings is to occur over a period of eight years.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Pelaksanaan Pelabelan Prestasi BEI bagi Bangunan Kerajaan
Implementation of BEI Performance Labelling for Government Buildings

Fasa Phase	**Kategori Bangunan** Building Category	**Jumlah Bangunan** Number of Buildings
Pertama First (2018)	Bangunan Kementerian dan Jabatan Kerajaan Persekutuan Federal Government Ministries and Department Buildings	100
Kedua Second (2019-2022)	i. Bangunan Pejabat Kerajaan Government Office Buildings ii. Hospital Kerajaan Government Hospitals iii. Universiti Awam Public Universities iv. Politeknik Polytechnic v. Sekolah Schools	1,900
Ketiga dan seterusnya Third and beyond (2023 ~)	i. Bangunan Pejabat Kerajaan Government Offices Buildings ii. Hospital Kerajaan Government Hospitals iii. Universiti Awam Public Universities iv. Politeknik Polytechnic v. Sekolah Schools	> 3,000

Label Bintang BEI
BEI Star Label

① **Kategori Bangunan** Building Category	② **Taraf Bintang** Star Rating	③ **Prestasi Tenaga Bangunan (Unit)** Building Energy Performance (Unit)
Pejabat/Hospital/ Universiti/Sekolah & Lain-lain Offices/Hospitals/ Universities/Schools & Others	1 Bintang: Sangat Tidak Cekap 5 Bintang: Sangat Cekap 1 Star: Very Inefficient 5 Star: Very Efficient	kWj/m²/tahun kWh/m²/year

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Pelabelan Prestasi BEI menafsirkan prestasi tenaga bangunan Kerajaan dari 2018 hingga 2023 dan seterusnya. Dengan 5,000 bangunan Kerajaan sebagai perintis, dianggarkan bahawa sekiranya kesemua bangunan ini dapat menjayakan inisiatif ini dengan meningkatkan prestasi bintang asalnya ke satu bintang yang lebih tinggi, mereka berupaya mencapai penjimatan tenaga elektrik yang besar iaitu sebanyak 902GWj, atau bersamaan dengan RM329 juta penjimatan tahunan dan anggaran pengurangan pelepasan Gas Rumah Hijau (GHG) sebanyak 626 ktCO2eq.

The BEI Performance Labelling appraises the energy performance of public buildings from 2018 to 2023 onwards. With 5,000 Government buildings pioneering this initiative, it is estimated that if all these buildings can increase their original star performance by one star, they can deliver a substantial 902GWh in energy savings, which is equivalent to RM329 million in annual savings and a Greenhouse Gas (GHG) emission reduction estimated at 626 ktCO2eq.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Standard Prestasi Tenaga Minimum (MEPS)

ST menganjurkan pelbagai kempen kesedaran kecekapan tenaga untuk menggalakkan orang awam supaya menggunakan peralatan atau kelengkapan elektrik yang memiliki penarafan bintang Standard Prestasi Tenaga Minimum (MEPS). Peralatan atau kelengkapan elektrik dengan penarafan bintang adalah lebih cekap tenaga; di mana semakin banyak bintang, semakin cekap penggunaan tenaga, dan bermakna penjimatan bil elektrik yang lebih baik untuk jangka masa panjang.

MEPS dilancarkan pada tahun 2013 dan sejak itu ST telah menguji kelengkapan pelbagai jenama sebelum mengeluarkan penarafan bintang kecekapan tenaga bagi setiap satu. Apabila perlu, ST juga akan mengkaji semula penarafan bintang bagi kelengkapan disebabkan oleh kemasukan model-model baharu di pasaran. Pada 2019, ST telah mengkaji semula model-model televisyen yang telah diberi penarafan bintang pada tahun 2012.

Bagi kelengkapan baharu, ST telah menjalankan kerja-kerja pengujian dan analisis data sebelum memberikan penarafan bintang MEPS. Pada 2019, periuk nasi dan ketuhar gelombang mikro telah diuji dan ditaraf. Penarafan akan mula berkuatkuasa pada 2021.

ST kini sedang menjalankan kajian awal bagi menentukan kecekapan tenaga bagi dua kelengkapan baharu - ketuhar elektrik dan penyejuk beku.

Kelengkapan lain yang bertaraf bintang MEPS termasuklah set televisyen, penyaman udara, kipas, peti sejuk dan lampu.

Penggunaan dan Penjimatan Tenaga daripada Kelengkapan MEPS pada 2019

Pada 2019, ST telah menganjurkan bengkel kecekapan tenaga dan MEPS untuk mengumpul data jualan dan maklumat bagi enam kelengkapan cekap tenaga: peti sejuk, penyaman udara, set televisyen, kipas domestik, lampu dan mesin basuh.

Ini adalah kelengkapan elektrik yang dikawal selia oleh ST yang memerlukan Perakuan Kelulusan sebelum ianya dipasarkan di negara ini.

Minimum Energy Performance Standards (MEPS)

The Commission organises various energy efficiency awareness campaigns to encourage the public to use electrical equipment or appliances that come with the Minimum Energy Performance Standards (MEPS) star-rating. Star-rated equipment and appliances are more energy efficient; the higher the star, the more efficient, and better for electricity bill savings in the longer term.

MEPS was launched in 2013 and saw the Commission testing different brands of appliances before issuing them with an energy efficiency star rating. As and when needed, the Commission reviews the star-rating of different equipment because of the entry of new models in the marketplace. In 2019, the Commission reviewed television models that were last star-rated in 2012.

For new appliances, the Commission tests and conducts data analysis prior to awarding them MEPS stars. In 2019, rice cookers and microwave ovens were tested and rated. This will take effect in 2021.

The Commission is currently carrying out preliminary research to determine the energy efficiency of two new appliances – the electric oven and freezer.

Other MEPS star-rated appliances include television sets, air conditioners, fans, refrigerators and lamps.

Energy Consumption and Savings from MEPS Appliances in 2019

In 2019, the Commission organised a workshop on energy efficiency and MEPS to gather sales data and information on six energy-efficient appliances: refrigerators, air-conditioners, television sets, domestic fans, lighting and washing machines.

These are ST-controlled electrical items that require Certificates of Approval before being sold in the country.

MEMPERKUKUHKAN KEBERTERUSAN BEKALAN DAN KEMAMPANAN TENAGA

Berdasarkan data penjualan daripada pengimport dan pengilang, dari Januari sehingga September 2019, keenam-enam kelengkapan MEPS ini telah menghasilkan Penggunaan Tenaga dan Penjimatan Tenaga Tahunan bagi 2019.

Based on sales data from importers and manufacturers between January and September 2019, these six MEPS-based appliances resulted in the following Annual Energy Consumption and Energy Savings in 2019.

Penggunaan Tenaga dan Penjimatan Tenaga bagi Enam Kelengkapan Elektrik
Energy Consumption and Energy Savings of Six Electrical Appliances

Kelengkapan Appliances	**Jumlah Jualan (Unit)** Total Sales (Unit)	**Penggunaan Tenaga (Pengilang & Pengimport) (GWj)** Energy Consumption (Manufacturers & Importers) (GWh)	**Penggunaan Tenaga Berdasarkan Penarafan Indeks 2 Bintang / Lampu T8* (GWj)** Energy Consumption Based on 2 Star Rating Index / T8 Lamps* (GWh)	**Penjimatan Tenaga Tahunan (GWj)** Annual Energy Savings (GWh)	**Penjimatan Tenaga Tahunan (%)** Annual Energy Savings (%)
Penyaman Udara Air Conditioners	1,013,962	2,858.67	3,751.55	892.88	23.8%
Kipas Fans	3,082,102	589.62	739.73	150.11	20.3%
Peti Sejuk Refrigerators	411,169	158.78	188.89	30.12	15.9%
Televisyen Televisions	573,838	78.84	132.02	53.18	40.3%
Lampu Lamps	52,964,140	2,035.88	3,194.24 *	1,158.36	36.3%
Mesin Basuh Washing Machines	477,013	11.51	23.90	12.39	51.8% **
Jumlah Total	58,522,224	5,733.30	8,030.33	2,297.04	

Nota:
* Data Penggunaan Tenaga (Pengilang dan Pengimport) yang diperolehi adalah berdasarkan kepada kelengkapan bertaraf 2, 3, 4 dan 5 bintang, manakala bagi kelengkapan lampu, data diperolehi daripada lampu-lampu jenis LED, LED T5, LED T8, CFL *Non-Integrated*, CFLi, *Fluorescent* T5 dan *Fluorescent* T8.
** Mesin Basuh mencatatkan jumlah penjimatan tertinggi di antara keenam-enam kelengkapan bertaraf MEPS dan bintang; penguatkuasaan MEPS dan penarafan bintang bagi mesin basuh bermula pada 2018.

Notes:
* Energy Consumption Data (Manufacturers and Importers) data obtained is based on 2, 3, 4 and 5-star rated appliances, while for lighting fixtures, data is obtained from LED type lights, LED T5, LED T8, CFL Non-Integrated , CFLi, Fluorescent T5 and Fluorescent T8.
** Washing machines recorded the highest savings among the six MEPS star-rated appliances; the enforcement of MEPS and star rating for washing machines began in 2018.

Penjimatan tenaga bagi penyaman udara, kipas, peti sejuk, televisyen dan mesin basuh yang bertaraf 3, 4 dan 5 bintang adalah lebih menjimatkan berbanding dengan kelengkapan yang bertaraf 2 bintang.

Bagi lampu dan kelengkapan yang menggunakan lampu LED, LED T5, LED T8, CFL *Non-Integrated*, CFLi dan *Fluorescent* T5, penjimatan tenaga adalah lebih banyak berbanding dengan yang menggunakan lampu *Fluorescent* T8.

Energy savings from 3, 4 and 5 star-rated air-conditioners, fans, refrigerators, televisions and washing machines are more efficient that those with a 2-star rating.

For lights and equipment using LED, LED T5, LED T8, CFL Non-Integrated, CFLi and Fluorescent T5 lamps, energy savings are more than those using Fluorescent T8 lamps.

STRENGTHENING ENERGY SECURITY AND SUSTAINABILITY

Kesimpulannya, peralatan dan kelengkapan bertaraf 5 bintang dapat memberikan penjimatan yang lebih banyak jika dibandingkan dengan kelengkapan bertaraf 2 Bintang manakala bagi lampu pula, penggunaan lampu jenis LED memberi lebih penjimatan berbanding lampu jenis T8 *Fluorescent*.

Analisa menunjukkan bahawa dengan penggunaan kelengkapan yang lebih cekap tenaga, penjimatan tenaga daripada enam kelengkapan elektrik ini berada dalam lingkungan 15.9% sehingga 51.8%.

Melangkah Ke Hadapan: Akta Kecekapan dan Konservasi Tenaga

Pada 8 Julai 2019, ST telah dilantik sebagai Pengurus Projek untuk merangka Rang Undang-Undang Kecekapan dan Konservasi Tenaga yang akan dibentangkan ke Parlimen pada 2021. Rang Undang-Undang ini bertujuan mewujudkan satu kerangka perundangan untuk mengawal selia, menguatkuasa, menyelaras dan melaksanakan inisiatif kecekapan yang merangkumi tenaga elektrik dan juga tenaga termal.

ST telah mengadakan beberapa mesyuarat dengan pelbagai pihak pemegang taruh untuk membincangkan kandungan Rang Undang-Undang yang perlu digubal.

In conclusion, 5-star equipment and appliances deliver more energy savings than 2-star equivalents; whereas for lighting, the use of LED type lamps is more economical than T8 Fluorescent lamps.

An analysis showed that by using more energy efficient appliances, energy savings from these six electrical appliances can range between 15.9% up to 51.8%.

Moving Forward: Energy Efficiency and Conservation Act

On 8 July 2019, the Commission was appointed as Project Manager to draft the Energy Efficiency and Conservation Bill to be tabled in Parliament in 2021. The bill aims to establish a comprehensive legal framework to regulate, enforce, coordinate and implement energy efficiency initiatives for electricity and thermal energy.

The Commission held several meetings with various stakeholders to deliberate on the content of the bill to be drafted.

BAB 04
CHAPTER 04

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

Malaysia sedang menuju ke arah deregulasi industri pembekalan elektrik yang akan dipacu oleh daya pasaran. Ini dijangka akan mewujudkan lebih persaingan, dan meningkatkan kecekapan, sambil menurunkan kos dan tarif.

Satu langkah ke arah ini adalah pembentukan Kawal Selia Berasaskan Insentif (IBR) di Semenanjung Malaysia pada 2014. IBR merupakan mekanisme penetapan tarif yang telus dan mencerminkan kos sebenar dalam rantaian bekalan elektrik di mana kadar tarif ditetapkan bagi tempoh regulatori selama tiga tahun. Pelaksanaan mekanisme *Imbalance Cost Pass Through* (ICPT) di bawah IBR pula menyemak kos bahan api dan kos penjanaan setiap enam bulan.

Pada 2019, IBR telah memasuki tahun kedua bagi pelaksanaan Tempoh Regulatori Kedua (RP2), dari 2018 ke 2020. Bagi Sabah pula, IBR akan diperkenalkan dalam beberapa tahun yang akan datang. Pada waktu yang sama, ST telah memperkenalkan beberapa ciri IBR di negeri tersebut. Tahun ini juga telah menyaksikan beberapa inisiatif liberalisasi industri pembekalan gas.

Melangkah ke hadapan, Kerajaan telah melancarkan MESI 2.0 pada September 2019 yang akan berperanan sebagai pelan tindakan pembaharuan yang akan dilaksanakan dari 2019 hingga 2025. MESI 2.0 akan meningkatkan lagi persaingan dalam industri, memperkasakan pengguna dan mewujudkan lebih banyak pilihan tenaga hijau.

Malaysia is moving towards a deregulated electricity supply industry, to be driven by market forces. This is expected to create more competition, which will increase efficiency while driving costs and tariffs down.

A step in this direction was the introduction of the Incentive Based Regulation (IBR) in Peninsular Malaysia in 2014. IBR is a transparent tariff-setting mechanism that reflects actual costs in the electricity supply chain where tariffs are fixed over a three-year Regulatory Period. A mechanism under IBR called Imbalance Cost Pass Through (ICPT) then reviews fuel prices and other generation costs every six months.

In 2019, IBR entered the second year of the Second Regulatory Period (RP2), from 2018 to 2020. For Sabah, IBR is to be introduced in the next few years. In the meantime, the Commission has put in place several IBR features in the state. The year also saw several initiatives to liberalise the gas supply industry.

Moving forward, the Government launched MESI 2.0 in September 2019 which will act as a road map of reforms to be implemented from 2019 to 2025. MESI 2.0 will step up competition in the industry, empower consumers and create more green energy choices.

SOROTAN 2019
2019 HIGHLIGHTS

- Pada 2019, pengguna telah dikenakan surcaj sebanyak RM3.71 billion setelah mekanisma ICPT mendapati bahawa unjuran harga bahan api adalah lebih rendah daripada harga sebenar bahan api.
- Harga gas yang dikawal selia telah mencapai harga pasaran pada 2019. Bermula 2020, harga gas berpaip akan ditetapkan berdasarkan harga pasaran.
- Pada bulan Oktober, sistem Akses Pihak Ketiga (TPA) Gas telah diuji dengan kemasukan Gas Asli Cecair (LNG) import yang pertama untuk stesen janakuasa TNB. Lima kontrak jual beli termasuk penggunaan kemudahan gas oleh pihak ketiga, telah ditandatangani. TNB melaporkan penjimatan hampir RM6 juta daripada hasil pembelian LNG di pasaran terbuka.
- Pada November 2019, Kerajaan telah meluluskan struktur tarif bagi penggunaan kemudahan gas dalam tempoh Regulatori Gas pertama, yang berkuatkuasa dari 1 Januari 2020 hingga 31 Disember 2022.
- Pada Oktober 2019, Kerajaan telah memperkenalkan *MyGreen+*, suatu skim tarif premium bagi pengguna yang berminat untuk membeli tenaga hijau.
- Pusat asuhan kanak-kanak yang telah berdaftar dengan Jabatan Kebajikan Masyarakat telah diberi diskaun sebanyak 20% bagi bil elektrik dari 1 November 2019 hingga 31 Disember 2020.
- ST telah mengemukakan Caj Rangkaian *(Wheeling)* Interim bagi *Third Party Green Contracts* untuk kelulusan Kerajaan.

- In 2019, consumers had to pay a surcharge of RM3.71 billion because the ICPT mechanism noted that the projected fuel costs were lower than the actual cost.
- Regulated gas prices reached market parity in 2019. Starting 2020, piped gas prices will be based on market prices.
- In October, the Gas Third Party Access (TPA) system was tested with the first delivery of imported Liquefied Natural Gas (LNG) for TNB power plants. Five contracts were signed, for sales and purchase as well as for the utilisation of gas facilities by the third party. TNB reported savings of almost RM6 million from buying LNG in the open market.
- In November 2019, the Government approved the tariff structure for the utilisation of gas facilities under the first Gas Regulatory Period, which takes effect from 1 January 2020 to 31 December 2022.
- In October 2019, the Government introduced MyGreen+, a premium tariff scheme for consumers wanting to buy green energy.
- Childcare centres registered with the Social Welfare Department were given a 20% discount for electricity bills from 1 November 2019 to 31 December 2020.
- The Commission submitted Interim Wheeling Charges for Third Party Green Contracts for Government approval.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

PERKARA UTAMA MENGENAI TEMPOH REGULATORI KEDUA (2018-2020)
KEY POINTS OF THE SECOND REGULATORY PERIOD (2018-2020)

Mekanisme IBR merupakan salah satu pembaharuan struktur di bawah MESI 1.0 yang diperkenalkan bagi memastikan penetapan tarif elektrik dilaksanakan secara telus dan berkesan.

Mekanisme IBR ini mula diuji pelaksanaannya ke atas pihak utiliti utama TNB di Semenanjung Malaysia pada 2014. Pada 2016 pula, IBR dilaksanakan ke atas pelanggan NUR di Kulim Hi-Tech Park (KHTP).

Di bawah mekanisme ini, kadar tarif asas elektrik yang ditetapkan IBR akan disemak setiap tiga tahun, yang dikenali sebagai Tempoh Regulatori. Tempoh Regulatori Pertama (RP1) telah bermula dari Januari 2015 sehingga Disember 2017, diikuti oleh Tempoh Regulatori Kedua (RP2) dari Januari 2018 hingga Disember 2020.

Tahun dalam semakan merupakan tahun kedua bagi pelaksanaan RP2.

The IBR mechanism is one of the structural reforms introduced under MESI 1.0, to ensure that electricity tariff setting is implemented in a transparent and effective manner.

The IBR mechanism was trialed with the national utility provider TNB in Peninsular Malaysia in 2014. In 2016, the IBR implementation was extended to NUR customers in Kulim Hi-Tech Park (KHTP).

Under this mechanism, the base electricity tariff rate set by the IBR is subject to a review every three years, known as the Regulatory Period. The First Regulatory Period (RP1) was from January 2015 to December 2017, followed by the Second Regulatory Period (RP2) from January 2018 to December 2020.

The year under review is the second year of RP2.

Tempoh Regulatori dan Kadar Tarif Asas Elektrik bagi TNB dan NUR
Regulatory Periods and Electricity Base Tariff Rates for TNB and NUR

Tempoh Kawal Selia Regulatory Period	**Utiliti yang Terlibat dalam Pelaksanaan IBR** Utilities Involved in IBR Implementation	
	TNB	**NUR**
2014	Tempoh Percubaan IBR IBR Trial Period	-
2015	Tempoh Regulatori Pertama First Regulatory Period Tarif Asas : 38.53 sen/kWj Base Tariff : 38.53 sen/kWh	-
2016		Tempoh Percubaan IBR IBR Trial Period
2017		
2018	Tempoh Regulatori Kedua Second Regulatory Period Tarif Asas : 39.45 sen/kWj Base Tariff : 39.45 sen/kWh	Tempoh Regulatori Pertama First Regulatory Period Tarif Asas : 35.70 sen/kWj Base Tariff : 35.70 sen/kWh
2019		
2020		

Di bawah RPI , tarif asas TNB ditetapkan sebanyak 38.53 sen/kWj. Pada RP2, tarif ini disemak semula ke 39.45 sen/kWj, iaitu peningkatan sebanyak 2.4%.
Under RP1, the base tariff for TNB was fixed at 38.53 sen/kWh. For RP2, it was revised to 39.45 sen/kWh, an increase of 2.4%.

ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

Antara faktor-faktor yang mempengaruhi semakan tarif di dalam kedua-dua tempoh regulatori berkenaan adalah ketidaktentuan harga bahan api dan kadar pertukaran mata wang asing.

Among the factors affecting the tariff revisions in both regulatory periods include the volatility of fuel prices and foreign currency exchange rates.

Penetapan Harga Tarif Asas Bahan Api TNB bagi Tempoh RP1 dan RP2
Setting of the Base Fuel Tariff Prices for TNB under RP1 and RP2

	Gas Berpaip Piped Gas	Arang Batu Coal	LNG
RP1	**RM15.20/mmBtu**	**USD87.50/MT** (Kadar Pertukaran: 3.100) (Exchange Rate: 3.100)	**RM41.68/mmBtu**
RP2	**RM24.20/mmBtu** (Jan-Jun 2018) (Jan-Jun 2018) **RM25.70/mmBtu** (Jul-Dis 2018) (Jul-Dec 2018) **RM27.20/mmBtu** (Jan 2019-Dis 2020) (Jan 2019-Dec 2020)	**USD75.00/MT** (Kadar Pertukaran: 4.212) (Exchange Rate: 4.212)	**RM35.00/mmBtu**

Pelaksanaan rangka kerja IBR menjadikan penetapan tarif elektrik kini lebih telus serta menjadikan cara pengiraannya lebih mudah untuk difahami.

Salah satu elemen utama dalam IBR adalah pemisahan laporan akaun regulatori TNB mengikut keenam-enam entiti bisnesnya, iaitu bahagian Penghantaran, Rangkaian Pengagihan, Pengendali Sistem Grid (GSO), Pembeli Tunggal (SB - Operasi), Pembeli Tunggal (SB - Penjanaan) dan Perkhidmatan Pengguna.

Pemisahan akaun telah meningkatkan ketelusan kos pembekalan elektrik di setiap peringkat rantaian pembekalan TNB. Ia juga menyingkirkan unsur subsidi bersilang *(cross-subsidy)* antara entiti-entiti bisnes di bawah TNB. ST turut mengawal selia setiap laporan tahunan akaun regulatori dengan teliti apabila menetapkan tarif elektrik.

Melalui mekanisme IBR, kefahaman mengenai pelbagai kos kini menjadi lebih jelas. Entiti bisnes penjanaan merupakan kos yang tertinggi (sekitar 70%) dan kadar tarif asasnya adalah ditetapkan pada 26.76 sen/kWj bagi tempoh RP1 dan 27.05 sen/kWj bagi tempoh RP2.

The implementation of the IBR framework makes the setting of electricity tariffs more transparent and its computation much easier to be understood.

One of the key elements of IBR was the unbundling of TNB's regulatory accounts reports by its six business entities, namely, the Transmission Division, Distribution Network, Grid System Operator (GSO), Single Buyer (SB - Operations), Single Buyer (SB - Generation) and Consumer Services.

The unbundling improves transparency of electricity supply costs across TNB's supply chain. It also removes instances of cross-subsidy between the business entities under TNB. The Commission also closely regulates each annual regulatory account report when setting electricity tariffs.

With the IBR mechanism, various costs are now more defined. The generation business entity made up the majority of cost (approximately 70%) and its base tariff rate was fixed at 26.76 sen/kWh during RP1 and 27.05 sen/kWh for RP2.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

Perbandingan Kadar Tarif Asas TNB bagi Tempoh RP1 dan RP2
Comparison of TNB's Base Tariff Rate for RP1 and RP2

Tempoh Regulatori 1
Regulatory Period 1
(2015-2017)

Komponen Component	sen/kWj sen/kWh
Pembeli Tunggal (Penjanaan) Single Buyer (Generation) **69.5%**	**26.76**
Penghantaran Transmission **9.5%**	**3.66**
Rangkaian Pengagihan & Perkhidmatan Pengguna Distribution Network & Customer Services **20.4%**	**7.87**
Pembeli Tunggal (Operasi) Single Buyer (Operations) **0.5%**	**0.19**
Pengendali Sistem Grid (GSO) Grid System Operator (GSO) **0.1%**	**0.05**
	38.53 sen/kWj sen/kWh

Imbalance Cost Pass-Through (ICPT) **Setiap Enam Bulan** Every Six Months

Tempoh Regulatori 2
Regulatory Period 2
(2018-2020)

Komponen Component	sen/kWj sen/kWh
Pembeli Tunggal (Penjanaan) Single Buyer (Generation) **68.5%**	**27.05**
Penghantaran Transmission **10.2%**	**4.03**
Rangkaian Pengagihan Distribution Network **18.0%**	**7.07**
Perkhidmatan Pengguna Customer Services **2.6%**	**1.04**
Pembeli Tunggal (Operasi) Single Buyer (Operations) **0.5%**	**0.19**
Pengendali Sistem Grid (GSO) Grid System Operator (GSO) **0.2%**	**0.07**
	39.45 sen/kWj sen/kWh

Komponen Perkhidmatan Pengguna Khusus bagi Tempoh RP2

Salah satu pencapaian penting bagi tempoh RP2 adalah pelaksanaan komponen perkhidmatan pengguna yang khusus, sekaligus dengan pertimbangan dan penilaiannya sendiri dalam skim penetapan tarif. Sebelum ini, perkhidmatan pengguna adalah sebahagian daripada komponen rangkaian pengagihan. Di dalam tempoh perkhidmatan RP2, ia diberi penekanan sebanyak 2.6% dengan nilai 1.04 sen/kWj dalam penetapan tarif TNB.

Peralihan ini mencerminkan keutamaan yang diberikan kepada perkhidmatan dan layanan yang lebih baik kepada pengguna TNB. Pada masa yang sama, ianya dilaksanakan sebagai persiapan dalam menghadapi liberalisasi pasaran baharu yang akan menjelang.

Dedicated Customer Services Component in RP2

A significant milestone of RP2 is the creation of a dedicated customer services component, with its own weightage and value in the overall scheme of tariff setting. Previously, customer services was part of the distribution network component. Under RP2, it has been given a 2.6% weightage, and a value of 1.04 sen/kWh when setting TNB tariffs.

This shift reflects priority being given to serving TNB customers better. At the same time, it was implemented in preparation for the upcoming liberalisation of the retail market.

ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

PENETAPAN REBAT DAN SURCAJ DALAM MEKANISME ICPT
DETERMINATION OF REBATE AND SURCHARGE UNDER THE ICPT MECHANISM

Mekanisme ICPT adalah komponen utama dalam pelaksanaan IBR. Ia melibatkan semakan semula setiap enam bulan terhadap perubahan kos bahan api atau kos penjanaan yang lain berbanding unjuran kos yang digunakan untuk penetapan tarif elektrik asas sepanjang Tempoh Regulatori.

Perbezaan antara kos yang diunjurkan dan kos sebenar bahan api akan diterjemahkan sama ada dalam bentuk rebat ataupun surcaj kepada pengguna.

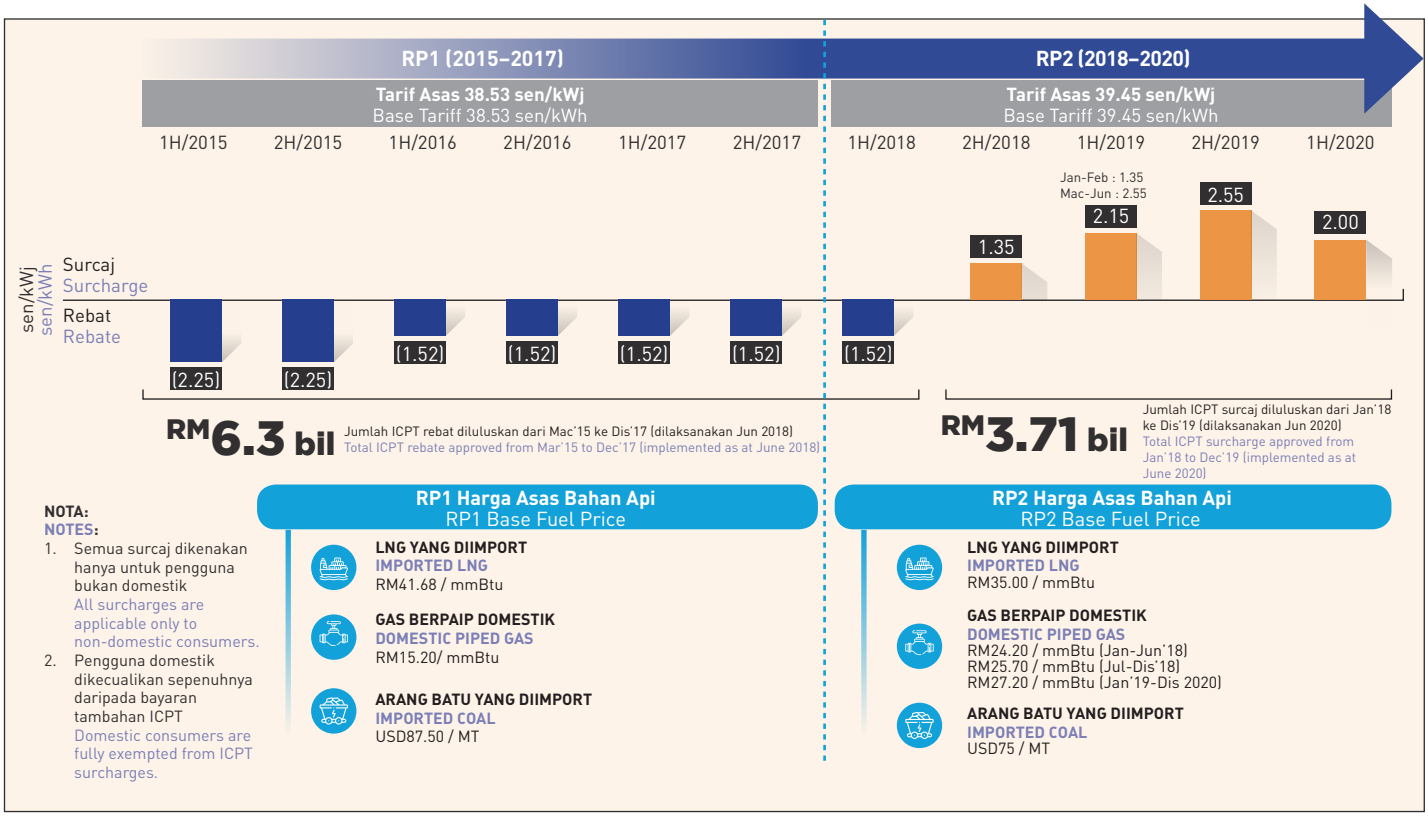
Sepanjang pelaksanaan RP1, sebanyak RM6.33 billion telah diterjemahkan dalam bentuk rebat kepada pengguna. Dalam tempoh dua tahun yang pertama RP2, pengguna telah dikenakan surcaj berjumlah RM3.71 billion berpunca daripada kos bahan api yang lebih tinggi semasa tempoh tersebut. Pengguna domestik dikecualikan sepenuhnya daripada bayaran surcaj.

The ICPT mechanism is a key component in the implementation of the IBR. It involves a 6-month review of variable fuel or other generation-related costs that is compared against the projected costs used to set the electricity base tariffs during the Regulatory Period.

The difference in projected and actual fuel costs is reflected in the form of either rebates or surcharges to consumers.

During RP1, rebates totaling RM6.33 billion were given to consumers. For the first two years of the RP2, consumers had to incur surcharges amounting to RM3.71 billion due to higher fuel costs. Domestic consumers are exempted from surcharges.

Pelaksanaan ICPT dalam tempoh RP1 dan RP2
Implementation of ICPT during RP1 and RP2



MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

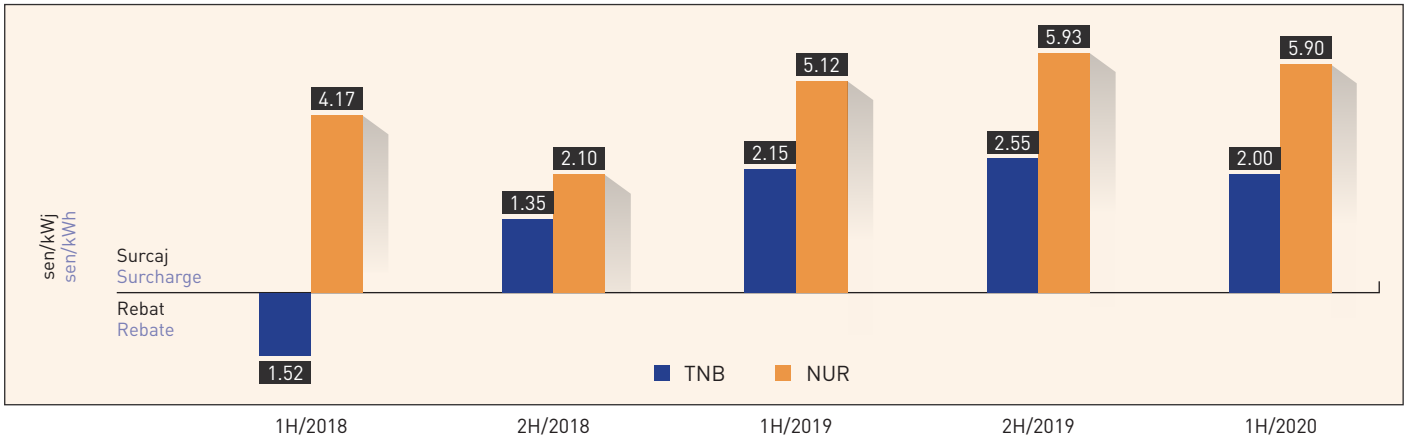
Penetapan Tarif Asas bagi RP2 dan Purata Harga Bahan Api Sebenar pada 2019
Setting of Base Tariff for RP2 and the Average Actual Fuel Prices in 2019

Utiliti Utilities	Harga Bahan Api Fuel Prices	
	Penetapan Harga Asas bagi RP2 Setting of the Base Price for RP2	Purata Harga Sebenar pada 2019 Actual Average Price in 2019
TNB	Gas Berpaip Piped Gas	
	RM24.20/mmBtu (Jan-Jun'18) RM25.70/mmBtu (Jul-Dis'18) RM27.20/mmBtu (Jan'19-Dis 2020)	RM27.95/mmBtu
	Arang Batu Coal	
	USD75/MT / RM14.47/mmBtu	USD86.28/MT / RM16.39/mmBtu
	LNG LNG	
	RM35.00/mmBtu	RM34.19/mmBtu
NUR	Gas Berpaip Piped Gas	
	RM18.20/mmBtu	RM27.95/mmBtu

ICPT juga digunapakai untuk pelanggan NUR, di mana kos ICPT NUR adalah lebih tinggi berbanding TNB disebabkan oleh kebergantungan NUR kepada sumber bahan api gas untuk penjanaan berbanding TNB yang menggunakan sumber lain iaitu arang batu di mana harganya adalah lebih murah.

The ICPT is also applicable to NUR consumers. NUR's ICPT cost is higher than TNB as it relies largely on gas as fuel for generation compared to TNB that utilises other sources such as coal which is relatively cheaper.

Pelaksanaan ICPT TNB dan NUR Setiap Enam Bulan, 2018 dan 2019
Implementation of ICPT for TNB and NUR Every Six Months, 2018 and 2019



ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

Prestasi IBR - KPI TNB pada 2019
IBR Performance - TNB's KPI in 2019

Kod Code	**Petunjuk Prestasi Utama** Key Performance Indicators	**Pencapaian** Achievement
TXPI1	Sistem Minit Hilang /System Minutes Lost	Neutral
TXPI2	Ketersediaan Sistem/System Availability	Neutral
TXPI3	Indeks Penyampaian Projek/Project Delivery Index (PDI)	Insentif/Incentive
TXPI4	Kehilangan Masa Kekerapan Kerosakan/Lost Time Injury Frequency	Memantau Sahaja/Monitor Only
DNPI1(a)	SAIDI Bandar/Urban: Kuala Lumpur	Neutral
DNPI1(b)	SAIDI Bandar/Urban: Shah Alam	Neutral
DNPI1(c)	SAIDI Bandar/Urban: Johor Bahru	Neutral
DNPI1(d)	SAIDI Bandar/Urban: Pulau Pinang	Neutral
DNPI1(e)	SAIDI Bandar/Urban: Petaling Jaya	Neutral
DNPI2	Pematuhan MSL 3B/MSL 3B Compliance	Insentif/Incentive
DNPI3	Kehilangan Masa Kekerapan Kerosakan/Lost Time Injury Frequency	Memantau Sahaja/Monitor Only
DNPI4 (keseluruhan)/ (overall)	Penyampaian Projek Khas (Indeks)/Special Projects Delivery (Index)	Memantau Sahaja/Monitor Only
DNPI4a	Indeks Penyampaian Projek Khas (AMI)/Special Projects Delivery Index (AMI)	Memantau Sahaja/Monitor Only
DNPI4b	Indeks Penyampaian Projek Khas (LED)/Special Projects Delivery Index (LED)	Memantau Sahaja/Monitor Only
CSPI1	Indeks Kepuasan Pelanggan/Customer Satisfaction Index	Insentif/Incentive
CSPI2	Purata Masa Kesambungan RE/Average RE Connection Time	Insentif/Incentive
CSPI3	Kepuasan dengan Program EE/Satisfaction with EE Programme	Insentif/Incentive
CSPI4	Penyampaian Program EE/Delivery of EE Programme	Memantau Sahaja/Monitor Only
SBPI1	Sisihan Kos Purata Sistem/System Average Cost Deviation	Memantau Sahaja/Monitor Only
SBPI2	Ketepatan Ramalan Beban/Load Forecast Accuracy	Neutral
SBPI3	Penjimatan Kos NEDA/NEDA Cost Savings	Neutral
SBPI4	Penyertaan NEDA/NEDA Participation	Neutral
SOPI1	*Wide Area Supply Loss*/Wide Area Supply Loss	Insentif/Incentive
SOPI2	Pematuhan Had Voltan/Voltage Limit Compliance	Insentif/Incentive
SOPI3	Pematuhan Had Frekuensi/Frequency Limit Compliance	Insentif/Incentive
SOPI4	Operasi Kos Paling Rendah/Least Cost Operation	Insentif/Incentive
SOPI5	Kehilangan Minit Sistem/System Minutes Lost	Neutral

Berdasarkan Laporan KPI 2019 TNB, kebanyakan KPI berada di dalam zon insentif and neutral. Pelaksanaan pemantauan KPI tersebut melibatkan implikasi kewangan dalam tempoh RP2.

Based on TNB's KPI Report for 2019, the majority of KPIs fell under the incentive and neutral zones. The implementation of KPI monitoring involves financial implications during RP2.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

Prestasi IBR - KPI NUR pada 2019
IBR Performance - NUR's KPI in 2019

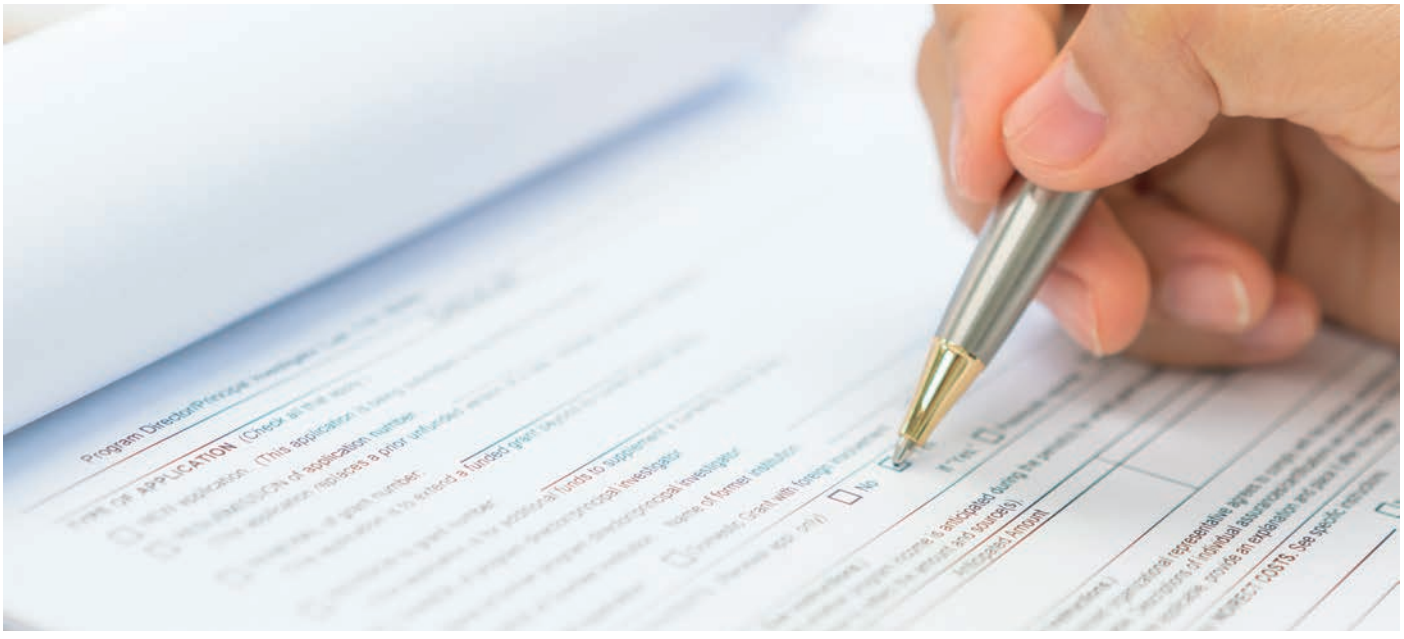
	Skim Insentif Prestasi Performance Incentive Scheme	**Pencapaian** Achievement
1	SAIDI HV	Neutral
2	SAIDI LV	Neutral
3	Kualiti Tenaga Power Quality	Memantau Monitor
4	Soalselidik Kepuasan Pelanggan Customer Satisfaction Survey	N/A
5	Gangguan Tidak Dirancang Berkesan Effective Unplanned Outage	Neutral
6	Program Penyelenggaraan Berkesan Effective Maintenance Programme	Insentif Incentive

Berdasarkan Laporan KPI 2019 NUR, hanya satu petunjuk – *Effective Maintenance Programme* – menunjukkan pencapaian di bawah had yang ditetapkan IBR dan berada di dalam zon insentif. KPI yang lain telah ditaksirkan sebagai neutral (tiga) dan tertakluk kepada pemantauan (satu). Manakala, satu KPI masih perlu dimuktamadkan.

Pelaksanaan pemantauan prestasi KPI NUR tidak melibatkan implikasi kewangan semasa RP1. Walau bagaimanapun, ini akan berubah dalam tempoh RP2.

Based on NUR's KPI Report for 2019, only one indicator – Effective Maintenance Programme – achieved below the limits set by IBR and lies in the incentive zone. The other KPIs were assessed as neutral (three) and subject to monitoring (one). One KPI is still to be finalised.

The implementation of KPI monitoring for NUR does not involve any financial implications during RP1. However, this is set to change under RP2.



KE ARAH LIBERALISASI INDUSTRI PEMBEKALAN GAS ASLI
TOWARDS LIBERALISATION OF THE NATURAL GAS SUPPLY INDUSTRY

Mekanisme IBR mendorong liberalisasi pasaran dengan pelaksanaan rantaian pembekalan gas asli yang lebih kompetitif dan cekap.

Sepanjang 2019, beberapa inisiatif dilaksanakan untuk mempercepatkan liberalisasi industri pembekalan gas asli.

Peralihan kepada Harga Gas Asli yang Ditentukan oleh Pasaran

Pembekal gas di Malaysia beroperasi di bawah struktur harga gas yang dikawal selia oleh Kerajaan bagi sektor elektrik yang dibekalkan oleh PETRONAS Energy & Gas Trading Sdn Bhd (PEGT) dan sektor bukan elektrik oleh Gas Malaysia Berhad (GMB).

Pada April 2014 dan Disember 2016, Mesyuarat Jemaah Menteri memutuskan supaya semakan harga gas asli yang dikawalselia bagi sektor bukan elektrik, termasuk GMB, dinaikkan secara automatik sebanyak RM1.50/mmBtu setiap enam bulan sehingga mencapai harga pasaran. Keputusan ini adalah selaras dengan Dasar Rasionalisasi Subsidi Kerajaan seperti yang telah digariskan di dalam Rancangan Malaysia Ke-11 (2016-2020).

Pada Julai 2019, harga gas yang dikawal selia dan dibekalkan oleh PEGT di Semenanjung Malaysia telah mencapai harga sasaran, di mana purata harga gas yang dikawal selia adalah pada kadar RM28.70/mmBtu pada setengah tahun kedua 2019, iaitu lebih tinggi berbanding purata *reference market price (RMP),* iaitu pada kadar RM26.69/mmBtu pada setengah tahun kedua 2019.

Pada masa yang sama, harga gas asli yang dikawal selia bagi sektor elektrik telah mencapai harga pasaran bagi *single tier pricing*. Berikutan itu, mulai Januari 2020 harga gas bagi sektor elektrik akan berdasarkan harga pasaran dan disemak setiap tiga bulan berdasarkan pergerakan harga pasaran gas.

The IBR mechanism promotes market liberalisation with the implementation of a more competitive and efficient natural gas supply chain.

In 2019, there were several initiatives to accelerate the liberalisation of the natural gas supply industry.

Transition to Market-Driven Natural Gas Prices

Gas suppliers in Malaysia operate under a regulated pricing structure set by the Government for the electricity sector that is supplied by PETRONAS Energy & Gas Trading Sdn Bhd (PEGT) and the non-electricity sector by Gas Malaysia Berhad (GMB).

In April 2014 and December 2016, the Cabinet decided that a review of the regulated natural gas prices for the non-electricity sector, including for GMB, to be increased automatically by RM1.50/mmBtu every six months until it reaches market parity. This decision was made in line with the Government's Subsidy Rationalisation Policy outlined in the 11th Malaysia Plan (2016-2020).

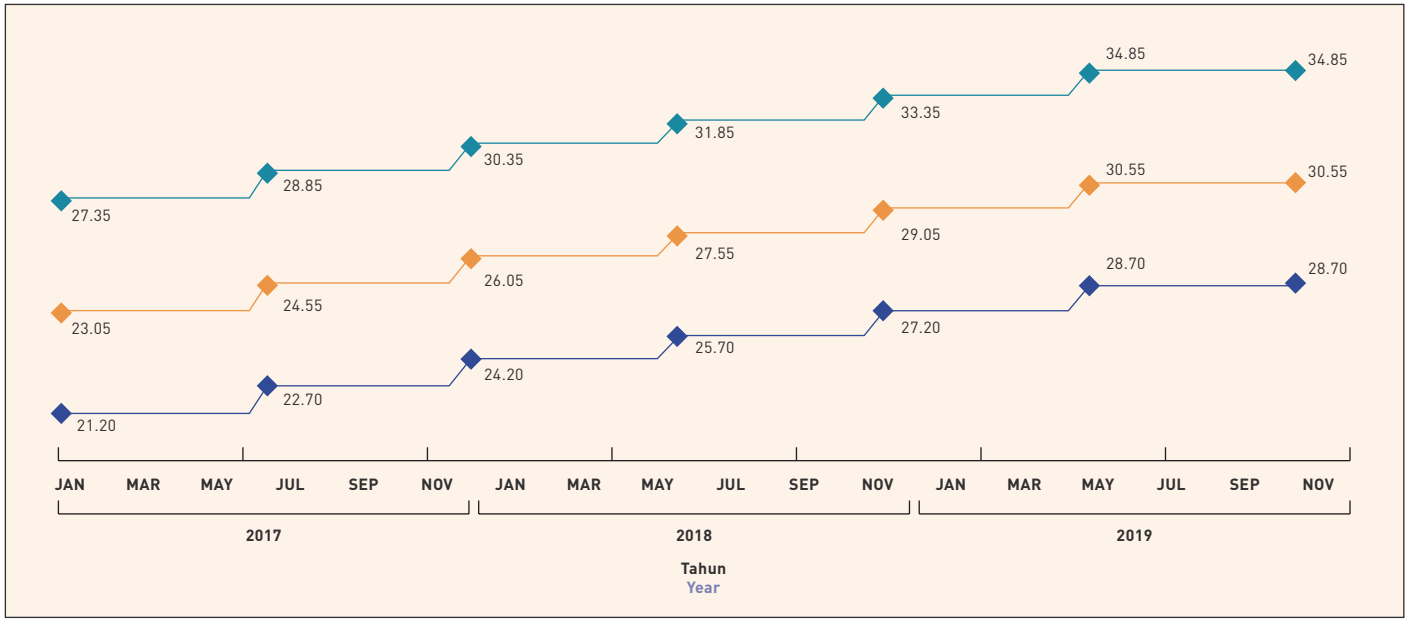
In July 2019, the regulated price of gas supplied by PEGT in Peninsular Malaysia achieved this target, whereby the average regulated gas price during the second half of 2019 was RM28.70/mmBtu, which was higher than the average reference market price (RMP) of RM26.69/mmBtu in the second half of 2019.

At the same time, regulated natural gas price for the electricity sector achieved market parity for single tier pricing. Following this, from January 2020 gas prices for the electricity sector is going to be market-driven and revised every three months based on the gas market price movements.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

Harga Gas Asli yang Dikawal Selia bagi Sektor Elektrik, GMB dan Pengguna Industri (selain GMB) di Segmen Penghantaran, 2017-2019

Regulated Gas Prices for the Electricity Sector, GMB and Industrial Customers (apart from GMB) in the Transmission Segment, 2017-2019



Penetapan Purata Harga Jualan Gas Asli oleh GMES bagi Tempoh Peralihan 2020-2021

Pada 2019, Kerajaan telah memutuskan untuk menetapkan harga jualan gas asli oleh Gas Malaysia Energy and Services Sdn Bhd (GMES) untuk segmen pengagihan di Semenanjung Malaysia bagi tempoh dua tahun iaitu dari 1 Januari 2020 hingga 31 Disember 2021, dengan syarat harga gas asli disemak setiap tahun. Harga purata jualan gas asli oleh GMES kepada pelanggan ditetapkan pada RM33.65/mmBtu bagi tempoh 1 Januari 2020 hingga 31 Disember 2020.

Sementara itu, harga jualan gas asli di antara PEGT dan GMES adalah berasaskan prinsip *"willing buyer willing seller"* yang menandakan suatu langkah penting ke arah liberalisasi pasaran.

Setting of Average Selling Price of Natural Gas by GMES for Transition Period 2020-2021

In 2019, the Government decided to fix the selling price of natural gas by Malaysia Energy and Services Sdn Bhd (GMES) for the distribution segment in Peninsular Malaysia for a period of two years, from 1 January 2020 to 31 December 2021, with a provision to revise the natural gas prices annually. The average selling price of natural gas by GMES to customers was set at RM33.65/mmBtu for the period of 1 January 2020 to 31 December 2020.

Meanwhile, the selling price of natural gas between PEGT and GMES is based on a "willing buyer-willing seller" basis, marking a significant step in market liberalisation.

ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

Harga Jualan Gas Asli GMES Mengikut Kategori Pelanggan, 1 Januari 2020-31 Disember 2020
GMES Natural Gas Selling Price by Customer Category, 1 January-31 December 2020

Kategori Category	**Purata Penggunaan Gas Tahunan** Average Annual Gas Consumption (mmBtu)	**Harga Jualan Semasa** Current Market Prices		**Harga Jualan Berkuatkuasa 1 Januari 2020 – 31 Disember 2021** Selling Price Effective 1 January 2020 – 31 December 2021
		Harga Asas Base Price	**Harga Selepas Surcaj** Price After Surcharge	**Harga** Price
		(RM/mmBtu)		
A	Runcit Untuk Pengguna Perumahan Retail for Households Consumers	23.52	25.44	25.10
B	0 - 600	30.40	32.32	31.71
C	601 - 5,000	30.56	32.48	31.86
D	5,001 - 50,000	30.86	32.78	32.15
E	50,001 - 200,000	32.20	34.12	33.45
F	200,001 - 750,000	32.20	34.12	33.45
L	Melebihi/Above 750,000	33.28	35.20	33.99
	Purata/Average	32.74	34.66	33.65

Penetapan Tarif Gas Asli GMB

Di bawah mekanisme IBR, penetapan tarif gas asli bagi GMB untuk Tempoh Regulatori 2017 hingga 2019 turut merangkumi pelaksanaan mekanisme *Gas Cost Pass Through* (GCPT). GCPT akan mengkaji perbezaan kos di antara purata harga gas sebenar dengan harga gas yang diunjurkan di dalam tarif asas IBR. Perbezaan ini akan disalurkan kepada pengguna samada dalam bentuk rebat atau surcaj.

Kadar GCPT bergantung pada harga gas sebenar yang berubah-ubah berdasarkan pembekalan dan permintaan pasaran.

Melalui pelaksanaan mekanisme GCPT, Kerajaan telah memutuskan untuk menetapkan kadar surcaj sebanyak RM0.23/mmBtu bagi 1 Januari hingga 14 Julai 2019 kepada semua kategori pelanggan GMB, berikutan berlaku peningkatan isipadu jualan gas asli berasaskan LNG yang telah sekaligus meningkatkan harga gas.

Bagi tempoh 15 Julai sehingga 31 Disember, kadar surcaj telah disemak semula kepada RM1.92/mmBtu bagi kesemua kategori tarif pelanggan GMB berikutan peningkatan harga gas asli akibat permintaan gas yang berasaskan harga indeks LNG yang semakin meningkat, disamping pelaksanaan rasionalisasi subsidi harga gas asli berpaip sebanyak RM1.50/mmBtu.

GMB Natural Gas Tariff Setting

Under the IBR mechanism, gas tariff setting for GMB for the Regulatory Period 2017 to 2019 will incorporate the Gas Cost Pass Through (GCPT) mechanism. GCPT will review cost differentials between the actual average gas price and projected gas price as reflected in the IBR base tariff. The difference is to be channelled to consumers either as rebates or surcharges.

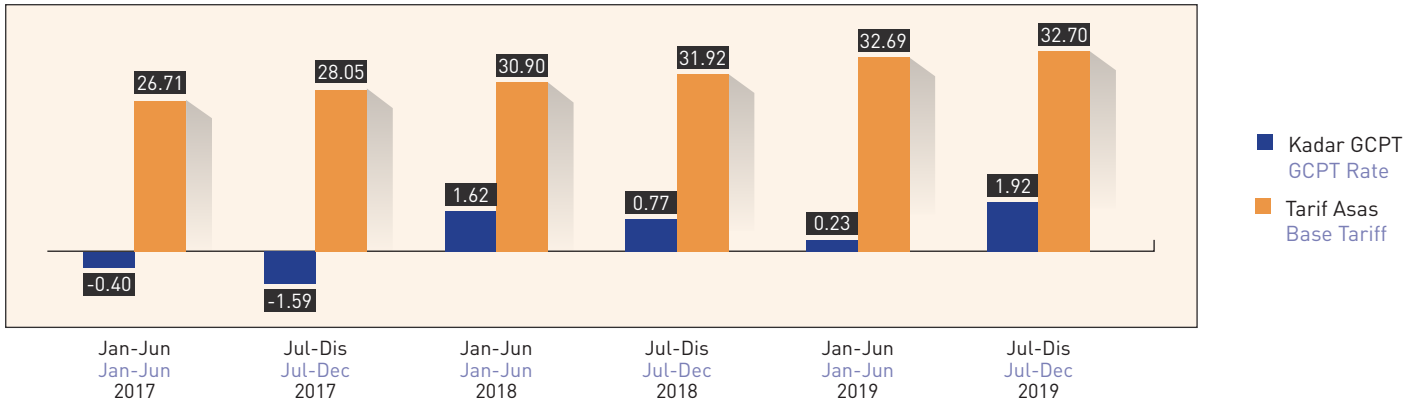
The GCPT rate will depend on actual gas prices that varies with market supply and demand.

Through the implementation of the GCPT mechanism, the Government decided on a surcharge rate of RM0.23/mmBtu from 1 January to 14 July 2019 that is applicable to all categories of GMB customers due to the increase in sales volume of natural gas based on LNG which resulted in higher gas prices.

During the period of 15 July to 31 December, the surcharge rate was revised to RM1.92/mmBtu, applicable to all GMB customer tariff categories following the increase of natural gas prices due to rising demand for gas based on LNG indexed price, coupled with the rationalisation of natural piped gas subsidy by as much as RM1.50/mmBtu.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

Tarif Asas IBR dan Kadar GCPT GMB, 2017-2019
IBR Base Tariff and GCPT Rate for GMB, 2017-2019



Penetapan Tarif bagi Penggunaan Kemudahan Gas

Mulai 1 Januari 2020, berikutan pelaksanaan sistem TPA Gas, ST akan menggunakan mekanisme IBR untuk menetapkan tarif bagi penggunaan kemudahan gas. Matlamatnya adalah untuk mencapai struktur tarif yang mencerminkan kos, cekap dan berkesan bagi semua yang terlibat dalam sistem TPA.

Proses penetapan tarif akan menentukan kos kepada pihak ketiga yang menggunakan kemudahan gas seperti terminal penggasan semula dan talian paip. Proses ini telah bermula pada April 2019, sebagai persiapan untuk pelaksanaan TPA Gas dalam Tempoh Regulatori 2020 ke 2022, dan mengambil kira penyerahan cadangan tarif oleh pemegang-pemegang lesen untuk mengendalikan kemudahan-kemudahan ini.

Cadangan tarif berkenaan adalah berdasarkan garis panduan yang telah dibangunkan dan dikuatkuasakan oleh ST.

Pada November 2019, Kerajaan telah meluluskan tarif bagi penggunaan kemudahan gas di bawah Tempoh Regulatori Gas pertama yang akan berkuatkuasa mulai 1 Januari 2020 hingga 31 Disember 2022. Tarif sepanjang tempoh tiga tahun ini adalah seperti berikut:

i. Purata tarif asas bagi penggunaan terminal penggasan semula milik Pengerang LNG (TWO) Sdn Bhd (RGTP) pada kadar RM3.485/GJ/hari.

ii. Purata tarif asas bagi penggunaan terminal penggasan semula milik Regas Terminal (Sg. Udang) Sdn Bhd (RGTSU) pada kadar RM3.455/GJ/hari.

iii. Purata tarif asas bagi penggunaan talian paip penghantaran milik PETRONAS Gas Bhd (PGB) pada kadar RM1.129/GJ/hari.

iv. Purata tarif asas bagi penggunaan talian paip pengagihan milik Gas Malaysia Distribution Sdn Bhd (GMD) pada kadar RM1.573/GJ/hari.

Tariff-setting for the Utilisation of Gas Facilities

From 1 January 2020, the Commission will apply the IBR mechanism to set tariffs for the use of gas facilities following the implementation of the Gas TPA system. The goal is for a tariff structure that is cost-reflective, efficient and effective for all parties involved in the TPA system.

The tariff setting process will determine the cost for third party utilisation of gas facilities such as regasification terminals and gas pipelines. The process began in April 2019, in preparation for the implementation of the Gas TPA under the first Regulatory Period from 2020 to 2022; and it took account of tariff proposal submissions by companies who are licensed to operate these facilities.

The tariff proposals were based on guidelines developed and enforced by the Commission.

In November 2019, the Government approved tariffs for the utilisation of gas facilities under the first Gas Regulatory Period that will take effect from 1 January 2020 to 31 December 2022. The tariff during these three years is as follows:

i. Average base tariff for the utilisation of regasification terminal owned by Pengerang LNG (TWO) Sdn BHD (RGTP) at RM3.485/GJ/day.

ii. Average base tariff for the utilisation of regasification terminal owned by Regas Terminal (Sg. Udang) Sdn Bhd (RGTSU) at RM3.455/GJ/day.

iii. Average base tariff for the utilisation of gas transmission pipeline owned by PETRONAS Gas Bhd (PGB) at RM1.129/GJ/day.

iv. Average base tariff for the utilisation of gas distribution pipeline owned by Gas Malaysia Distribution Sdn Bhd (GMD) at RM1.573/GJ/day.

HARGA BAHAN API BAGI PENETAPAN TARIF ELEKTRIK
FUEL PRICES FOR ELECTRICITY TARIFF SETTING

Trend Harga Bahan Api pada 2019
Fuel Price Trends in 2019

Arang Batu (RM/tan metrik) Coal (RM/metric tonne)				
Jenis Arang Batu Type of Coal	Q1 2019	Q2 2019	Q3 2019	Q4 2019
Bituminous	436	396	360	308
Sub-Bituminous	394	355	332	296
Gas (RM/mmBtu)				
Harga Gas Asli Yang Dikawal selia Regulated Natural Gas Prices	27.20	27.20	28.70	28.70

Pada keseluruhannya, harga arang batu telah mencatatkan penurunan pada 2019. Harga arang batu *bituminous* mencatatkan penurunan daripada purata RM411/tan pada 2018 kepada RM375/tan pada 2019. Harga arang batu *sub-bituminous* turut jatuh, daripada purata RM366/tan pada 2018 kepada RM344/tan pada 2019.

Sejumlah 32.65 juta tan arang batu telah dibekalkan kepada stesen-stesen janakuasa di Semenanjung. Pembekal terbesar adalah Indonesia yang membentuk 59% daripada jumlah import, diikuti oleh Australia (24%), Rusia (14%) dan Afrika Selatan (3%).

Inisiatif bagi Keberterusan Pembekalan Arang Batu

Bagi menangani impak ketidaktentuan harga arang batu dan memastikan keberterusan bekalan arang batu untuk jangka panjang, ST dan pemegang-pemegang taruh industri telah memperkenalkan inisiatif-inisiatif berikut:

a. Pelaksanaan penetapan *Applicable Coal Price (ACP)* secara individu bagi kesemua stesen janakuasa mulai suku kedua 2019. Dengan ini, kos pembekalan arang batu kepada setiap stesen janakuasa adalah berbeza daripada amalan terdahulu di mana ACP ditetapkan secara *average basket price* bagi arang batu *sub-bituminous* dan *bituminous* yang dibeli setiap suku tahun dan dibahagikan mengikut nisbah arang batu di dalam Perjanjian Pembelian Tenaga (PPA).

b. Penggantungan pelaksanaan pembekalan *Preferred Coal* yang membenarkan stesen janakuasa untuk menerima semua bekalan arang batu berdasarkan spesifikasi dan senarai yang telah dipersetujui.

c. Pelaksanaan Audit Perolehan Arang Batu bagi menyemak semula amalan perolehan sedia ada termasuk penentuan kos dan penetapan harga yang akan diterjemahkan kepada pengguna.

Overall, the price of coal fell in 2019. Bituminous coal prices recorded a decrease from an average of RM411/tonne in 2018 to RM375/tonne in 2019. The price of sub-bituminous coal also fell, from an average of RM366/tonne in 2018 to RM344/tonne in 2019.

A total of 32.65 million tonnes of coal was supplied to power stations in Peninsular Malaysia. The largest supplier is Indonesia, which accounted for 59% of imports, followed by Australia (24%), Russia (14%) and South Africa (3%).

Initiatives for the Security of Coal Supply

To address the impact of volatile coal prices and ensure long term coal supply, the Commission and industry stakeholders introduced the following initiatives:

a. Implementation of Applicable Coal Price (ACP) setting on an individual basis for all power stations from the second quarter of 2019. With this, the cost of coal supply to each power station departed from the previous practice whereby the ACP was determined based on an average basket price for sub-bituminous and bituminous coals bought every quarter and divided according to the coal ratio in Power Purchase Agreement (PPA).

b. Suspension of Preferred Coal Supply that had allowed power stations to receive their coal supply based on pre-agreed specifications and lists.

c. Implementation of Coal Procurement Audits to review existing procurement practices including the determination of costs and pricing that is to be reflected onto consumers.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

PELAKSANAAN KERANGKA IBR UNTUK SESB
IMPLEMENTATION OF THE IBR FRAMEWORK FOR SESB

Pada 2019, cadangan pelaksanaan mekanisme IBR di Sabah telah dikemaskini, mengambil kira unjuran permintaan elektrik terkini seperti yang digariskan di dalam Pelan Pembangunan Penjanaan Sabah. Pelan tersebut adalah tertakluk kepada persetujuan pihak Kerajaan Negeri Sabah. Memandangkan adalah amat mencabar bagi SESB untuk menaikkan kadar tarif purata elektrik di Sabah, maka bagi tempoh RP1 untuk IBR ini, ST mencadangkan agar tarif purata asas dikekalkan pada kadar semasa, iaitu 34.52 sen/kWj.

Walaupun mekanisme IBR masih belum dilaksanakan di Sabah, pelbagai langkah persediaan yang selaras dengan cadangan garis panduan IBR 2016 telah diambil oleh ST dan SESB. Antaranya adalah pemantauan Petunjuk Prestasi Utama SESB, penyediaan dokumen *Service Level Agreements (SLA)* bagi penjana kuasa, penyediaan *Revenue Requirement Model (RRM)* bagi penjanaan pendapatan dan penyediaan cadangan *Tariff Design (Rebalancing)* bagi menyemak jadual tarif sedia ada.

In 2019, the proposal for the implementation of the IBR mechanism in Sabah was updated whereby it took into account the latest electricity demand forecasts as outlined in the Sabah Generation Development Plan. The Plan is subject to approval by the Sabah State Government. The observation is that it will be challenging for SESB to increase the average electricity tariffs in Sabah; therefore the Commission recommends that the average base tariff be maintained at the current rate of 34.52 sen/kWh, during RP1 of IBR for the state.

Although the IBR mechanism has not been implemented in Sabah, the Commission and SESB have taken various steps in accordance with the proposed 2016 IBR guidelines. Among them is the monitoring of SESB's Key Performance Indicators, preparation of Service Level Agreements (SLA) for power producers, Revenue Requirement Model (RRM) to generate income and a proposed Tariff Design (Rebalancing) to review the existing tariff schedule.

Pihak Kerajaan Persekutuan terus menyalurkan bantuan subsidi kepada SESB memandangkan tiada kenaikan tarif elektrik di Sabah; purata tarif asas masih kekal pada kadar 34.52 sen/kWj sejak 2014. Subsidi ini adalah bertujuan untuk menampung kos bekalan elektrik sebenar yang tinggi di Sabah. Kos per unit bagi tahun kewangan 2019 adalah sebanyak 42.34 sen/kWj berbanding purata harga jualan sebanyak 34.26 sen/kWj.

Bagi 2019, Kerajaan Persekutuan telah memperuntukkan subsidi berjumlah hampir RM665 juta yang meliputi subsidi bahan api, solar dan sokongan tarif.

The Federal Government has continued to provide subsidies to SESB since there has been no increase in electricity tariffs in the state; the average base tariff rate has remained at 34.52 sen/kWh since 2014. The subsidy is to cover the actual cost of electricity supply in Sabah that is relatively high. The cost per unit for the financial year 2019 was 42.34 sen/kWh compared to the Average Selling Price of 34.26 sen/kWh.

In 2019, the Federal Government allocated subsidies amounting to almost RM665 million that covered fuel, solar and tariff support subsidies.

Subsidi Kerajaan Persekutuan kepada SESB bagi 2019
Federal Government Subsidies for SESB in 2019

Subsidi Solar Solar Subsidy	RM33.5 Juta/Million
Subsidi Bahan Api Fuel Subsidy	RM279.6 Juta/Million
Subsidi Sokongan Tarif Tariff Support Subsidy	RM351.8 Juta/Million
Jumlah **Total**	**RM664.9 Juta/ Million**

PENGURUSAN DAN KEMAMPANAN KUMPULAN WANG INDUSTRI ELEKTRIK (KWIE)
MANAGEMENT AND SUSTAINABILITY OF THE ELECTRICITY INDUSTRY FUND (KWIE)

Kumpulan Wang Industri Elektrik (KWIE) telah ditubuhkan pada 1 Januari 2016 untuk membantu mengurangkan impak tarif kepada pengguna. Dana ini merangkumi sumber seperti yang diperuntukkan di bawah Seksyen 44C(2)(a) hingga (d) dalam Akta Bekalan Elektrik 1990. Tadbir urus dana ini dikendalikan oleh ST, manakala penggunaan wang dana adalah berdasarkan peruntukan di bawah Seksyen 44C(3)(a) dan (b), Akta Bekalan Elektrik 1990.

Kumpulan Wang Industri Elektrik (KWIE) or Electricity Industry Fund was established on 1 January 2016 to help cushion the tariff impact on consumers. The Fund is made up of sources as stipulated in Section 44C(2)(a) to (d) of the Electricity Supply Act 1990. The Commission oversees the management of the Fund, while the usage of funds is based on the provisions in Section 44C(3)(a) and (b) of the Electricity Supply Act 1990.

Semakan Formula Sumbangan Pemegang Lesen di Semenanjung Malaysia kepada KWIE
Revision of the KWIE Contribution Formula for Licensees in Peninsular Malaysia

Pada 2019, ST telah menetapkan formula bagi kutipan sumbangan KWIE daripada pemegang lesen yang akan dilaksanakan pada 2020.

Satu sesi bersama pemegang taruh telah diadakan pada April 2019, antara wakil Kementerian dan Pemegang Lesen Penjanaan, Penjana Tenaga Bebas (IPP) dan utiliti di Semenanjung Malaysia, bagi mendapatkan pandangan dan maklum balas mengenai formula sumbangan kepada KWIE.

Berdasarkan maklum balas daripada sesi tersebut, cadangan formula sumbangan kepada KWIE oleh Pemegang Lesen Penjanaan (bagi kategori utiliti dan IPP) di Semenanjung Malaysia telah diluluskan pada Mei 2019.

Cadangan formula Pemegang Lesen Penjanaan (bagi kategori bukan utiliti dan bukan IPP) di Semenanjung Malaysia telah diluluskan pada Ogos 2019.

Formula sumbangan kepada KWIE telah diluluskan oleh MESTECC pada Oktober 2019.

In 2019, the Commission developed a formula for the collection of KWIE contributions from its licensees that is to take effect in 2020.

A session with the stakeholders was held in April 2019, between representatives from the Ministry, Generation Licensees, Independent Power Producers (IPPs) and utilities in Peninsular Malaysia, to gather their views on the KWIE contribution formula.

Based on the feedback from the session, the proposed formula for KWIE contributions by the Generation Licensees (utility and IPP category) in Peninsular Malaysia was approved in May 2019.

The formula Generation Licensees (non-utility and non-IPP category) in Peninsular Malaysia was approved in August 2019.

The KWIE's contribution formula was approved by MESTECC in October 2019.

Panduan Sumbangan Pemegang Lesen di Semenanjung Malaysia kepada KWIE
A Guide to KWIE Contribution by Licensees in Peninsular Malaysia

Sebagai persediaan bagi kutipan sumbangan daripada pemegang lesen kepada KWIE pada 2020, satu panduan telah disediakan sebagai rujukan kepada pemegang lesen. Panduan ini menerangkan secara terperinci definisi sumbangan, keperluan membuat sumbangan, cara dan masa pembayaran serta tatacara bagi tuntutan semula jumlah sumbangan yang terlebih bayar atau yang terkurang bayar.

Panduan Sumbangan Pemegang Lesen kepada KWIE telah diluluskan pada November 2019 dan akan digunakan sebagai rujukan bagi pemegang lesen.

In preparation for the collection of contributions to KWIE from licensees in 2020, a guide was prepared as a reference for licensees. The Guide detailed the definition of contributions, the need of contribution, mode and time of payment and the procedures for refunds for excess payments and claims for shortage of payments.

The Guide to KWIE Contribution by Licensees was approved in November 2019 and is to be used as a reference by the licensees.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

Manual Prosedur Pengurusan Kewangan KWIE (MPPK KWIE)
KWIE Fund Management Procedure Manual (MPPK KWIE)

Bagi memastikan pengurusan dana KWIE adalah cekap dan telus serta memaparkan kawalan dalaman yang lebih baik, Manual Prosedur Pengurusan Kewangan KWIE (MPPK KWIE) telah disediakan. Manual ini akan dijadikan rujukan dan panduan bagi pengurusan dana KWIE.

Manual ini telah diluluskan pada November 2019.

To ensure the efficient and transparent management of the KWIE fund and for better internal controls, the KWIE Fund Management Procedure Manual (MPPK KWIE) was produced. This manual will serve as a reference and guide in the management of the KWIE fund.

The manual was approved in November 2019.

Penempatan Dana KWIE dalam Akaun Simpanan Tetap (FD) dan *Short Term Money Market Deposit Islamic*
Placement of KWIE Funds in Fixed Deposit (FD) and Short-Term Money Market Deposit Islamic Accounts

Pada 2019, KWIE telah menempatkan dananya dalam akaun simpanan tetap dan *Short-Term Money Market Deposit Islamic* sebanyak sembilan kali. Dana ini ditempatkan di institusi kewangan yang diluluskan oleh Kementerian Kewangan pada kadar purata pulangan tahunan sebanyak 3.60%.

Kadar keuntungan adalah lebih rendah bagi 2019 berbanding tempoh yang sama pada 2018. Ini disebabkan oleh pengumuman Bank Negara pada Mei 2019 tentang penurunan kadar *Overnight Policy Rate (OPR)* sebanyak 0.25%. Bank Negara juga telah mengumumkan *Base Lending Rate (BLR)* yang lebih rendah berkuatkuasa pada Jun 2019. Berikutan itu, KWIE mencatatkan pulangan lebih rendah bagi 2019 (3.60%) berbanding dengan 2018 (4.24%).

In 2019, KWIE had deposited its funds into Fixed Deposit and Short-Term Money Market Deposit Islamic accounts in nine instances. They were placed at financial institutions approved by the Ministry of Finance and had an average annual rate of return at 3.60%.

The profit rate was lower in 2019, compared with the same period in 2018. This was due to the Bank Negara announcement in May 2019 for lower Overnight Policy Rate (OPR) by 0.25%. Bank Negara also announced a lower Base Lending Rate (BLR) effective June 2019. As a result, KWIE recorded a lower rate of return in 2019 (3.60%) compared to 2018 (4.24%).

Hala Tuju 2020
Direction in 2020

Berikutan kelulusan formula sumbangan oleh Kementerian pada November 2019:
Following the Ministry's approval on the contribution formula in November 2019:

1

Kesemua sumbangan daripada pemegang-pemegang lesen di Semenanjung Malaysia harus dibuat kepada KWIE, berkuatkuasa mulai 1 Januari 2020.
All contributions from licensees in Peninsular Malaysia are to be made to KWIE, effective January 2020.

2

Akaun Amanah Industri Bekalan Elektrik (AAIBE) bagi Semenanjung Malaysia tidak lagi menerima sebarang sumbangan daripada pemegang-pemegang lesen, kecuali sumbangan pada tahun kewangan 2018.
The Akaun Amanah Industri Bekalan Elektrik (AAIBE) or Energy Supply Industry Trust Fund for Peninsular Malaysia will no longer receive contributions from licensees; with the exception of contributions paid for the financial year 2018.

3

Formula sumbangan bagi Pemegang Lesen Penjanaan di Semenanjung Malaysia telah ditetapkan pada 1% daripada hasil, ditolak kos bahan api yang telah diaudit bagi tahun kewangan 2019. Bagi tahun kewangan 2020 dan seterusnya, sumbangan telah ditetapkan pada 1.25% daripada hasil, ditolak kos bahan api yang telah diaudit.
The contribution formula for Generation Licensees in Peninsular Malaysia is set at 1% of the revenue, less audited fuel costs for the financial year 2019. For the financial year 2020 onwards, contributions have been set at 1.25% of revenue less audited fuel costs.

Kutipan sumbangan KWIE akan bermula pada 2020 setelah Perintah Sumbangan KWIE diwartakan.
The collection of KWIE contributions will commence in 2020, following the gazetting of the KWIE Contribution Order.

INISIATIF MENINGKATKAN PERSAINGAN INDUSTRI
INITIATIVES TO BOOST INDUSTRY COMPETITION

Bidaan Terbuka Projek Solar Berskala Besar

Bagi menambah kapasiti Solar Berskala Besar (LSS), ST telah memulakan bidaan terbuka atau kompetitif, selaras dengan prosedur bidaan bagi kapasiti bahan api konvensional. Setakat penghujung 2019, tiga pusingan bidaan LSS telah dilaksanakan, di mana syarikat/konsortium yang berkelayakan telah dijemput untuk mengemukakan cadangan bagi membangunkan projek LSS berdasarkan kriteria yang ditetapkan oleh ST dalam dokumen *Request for Proposal*. Syarikat/konsortium yang menawarkan harga tarif yang kompetitif serta memenuhi kriteria-kriteria yang ditetapkan oleh ST telah dilantik untuk membangunkan projek LSS.

Open Bidding for Large Scale Solar Projects

To increase Large Scale Solar (LSS) capacity, the Commission initiated open or competitive bidding, in line with tender procedures applicable to conventional fuel capacity. As at end 2019, there had been three LSS bidding cycles, where eligible companies/consortiums were invited to submit proposals to develop LSS projects based on the criteria outlined by the Commission in the Request for Proposal. Companies/consortiums that offered competitive tariffs while meeting the criteria set out by the Commission were appointed to develop the LSS projects.

New Enhanced Dispatch Arrangement (NEDA) Diperluaskan kepada Projek Solar Berskala Besar

Salah satu ciri yang diperkenalkan dalam proses bidaan LSS3 pada 2019 adalah peluang kepada pembida untuk menyertai *New Enhanced Dispatch Arrangement* (NEDA), iaitu mekanisme untuk menjual penjanaan yang berlebihan kepada grid. Sebelum ini, penjana LSS tidak dapat menyertai program NEDA.

Langkah ini merupakan insentif untuk menggalakkan penyertaan penjana LSS yang berkelayakan tinggi, yang boleh mendapat manfaat daripada penjanaan Tenaga Boleh Baharu (TBB) untuk dijual kepada grid pada harga yang kompetitif.

Sementara itu, Single Buyer, GSO dan ST telah berusaha untuk menambahbaik mekanisme NEDA melalui Kajian *NEDA Viability*. Kajian ini bertujuan menarik minat penjana untuk menyertai NEDA, sejajar dengan objektif NEDA dan pelan tindakan MESI.

Syor-syor daripada kajian ini telah diterapkan ke dalam *Guidelines for NEDA* pada Disember 2019, di mana pelaksanaan sepenuhnya dijangkakan akan berlaku pada suku ketiga tahun 2020. Ini merupakan salah satu pembaharuan utama MESI 2.0 bagi membantu liberalisasi pasaran dan menyokong peningkatan pembangunan kapasiti TBB di Malaysia.

New Enhanced Dispatch Arrangement (NEDA) Extended to Large Scale Solar Projects

One of the features introduced in the LSS3 bidding in 2019 was the ability for the bidder to consider participating in the New Enhanced Dispatch Arrangement (NEDA), a mechanism to sell surplus generation to the grid. Prior to this, LSS producers could not participate in NEDA.

This move is seen as an incentive to attract the participation of LSS producers with strong credentials, who can benefit from generating Renewable Energy (RE) that can be sold to the grid at competitive prices.

In the meantime, the Single Buyer, GSO and the Commission have sought to improve the NEDA mechanism by undertaking the NEDA Viability Study. The study aims to attract power generators to participate in NEDA, in line with the objectives of NEDA as well as the MESI roadmap.

Recommendations from this study were incorporated into the Guidelines for NEDA in December 2019, with full implementation scheduled for the third quarter of 2020. This is one of the priorities of the MESI 2.0 reforms to facilitate market liberalisation and support the increase of RE capacity development in Malaysia.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

TPA Gas - Penghantaran Pertama

Pada 7 Oktober 2019, penghantaran LNG sebanyak kira-kira 160,000 m^3 / 3.69 juta GJ / 3.5 TBTU telah tiba di RGTSU milik Petronas di Melaka. Kargo ini telah diimport oleh Shell Malaysia Trading Sdn Bhd (SMTSB) dan akan disalurkan kepada pelanggannya, TNB, melalui rangkaian talian paip gas. Gas tersebut adalah untuk stesen janakuasa TNB iaitu Stesen Janakuasa Tuanku Jaafar di Negeri Sembilan dan Stesen Janakuasa Jambatan Connaught di Selangor.

Penghantaran LNG ini menandakan pelaksanaan pembekalan gas menerusi sistem TPA yang telah diperkenalkan pada 2017. Penghantaran pertama ini telah melibatkan lima kontrak antara pihak-pihak yang bersetuju dalam usahasama ini.

- *Terminal User Agreement:* Shell Malaysia Trading Sdn Bhd (SMTSB) bersama Terminal Penggasan Semula (Sg. Udang) Sdn Bhd
- *Gas Transportation Agreement:* Shell Malaysia Trading Sdn Bhd (SMTSB) bersama Petronas Gas Berhad (PGB)
- *Inter Capacity User Agreement:* SMTSB bersama Petronas Energy dan Gas Trading Sdn Bhd (PEGT)
- *Master Sales Agreement:* TNB Fuel Sdn Bhd bersama SMTSB
- *Gas Sales Agreement:* TNBF bersama TNB dan TNBCB

Melalui persetujuan ini, stesen-stesen janakuasa TNB terlibat telah menerima pembekalan gas masing-masing dari 7 hingga 19 Oktober 2019. Transaksi ini telah menghasilkan penjimatan keseluruhan sebanyak RM5.95 juta kepada TNB, hasil daripada pembelian gas pada harga pasaran terbuka berbanding dengan harga kawalan *Tier 1* gas berpaip.

Gas TPA - First Shipment

On 7 October 2019, an LNG shipment of approximately 160,000 m^3 / 3.69 million GJ / 3.5 TBTU arrived at the Petronas RGTSU in Melaka. The cargo was imported by Shell Malaysia Trading Sdn Bhd (SMTSB) and was transported via the gas pipeline network and delivered to the customer, TNB. The gas was for TNB power plants namely Tuanku Jaafar Power Station in Negeri Sembilan and Connaught Bridge Power Station in Selangor.

This LNG delivery marked the beginning of the implementation of the supply of gas via TPA which was introduced in 2017. The first shipment saw five contracts between willing parties.

- *Terminal User Agreement:* Shell Malaysia Trading Sdn Bhd (SMTSB) with Regasification Terminal (Sg. Udang) Sdn Bhd
- *Gas Transportation Agreement:* Shell Malaysia Trading Sdn Bhd (SMTSB) with Petronas Gas Berhad (PGB)
- *Inter Capacity User Agreement:* SMTSB with Petronas Energy and Gas Trading Sdn Bhd (PEGT)
- *Master Sales Agreement:* TNB Fuel Sdn Bhd with SMTSB
- *Gas Sales Agreement:* TNBF with TNB and TNBCB

Through this arrangement, the above-mentioned TNB power plants obtained their gas supply between 7 and 19 October 2019. For TNB, the transaction resulted in a total savings of RM5.95 million from buying gas in the open market instead of regulated piped gas at Tier 1 prices.

ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

Di bawah sistem TPA, pemegang lesen pengiriman diberi akses kepada kemudahan gas yang dimiliki dan dikendalikan oleh PGB (terminal penggasan semula dan rangkaian penghantaran) dan GMD (rangkaian pengagihan). Sebelum ini, Petronas and Gas Malaysia merupakan pembekal eksklusif bagi gas di negara ini, di mana Petronas membekal ke pasaran borong dan Gas Malaysia membekal ke pasaran runcit. Pindaan 2016 pada Akta Bekalan Gas 1993, yang telah berkuatkuasa pada 16 Januari 2017, telah menyediakan rangka perundangan TPA yang membenarkan pemegang lesen pengiriman lain untuk membekalkan gas kepada pasaran gas di Malaysia, dengan mengakses kemudahan yang sedia ada. Lesen-lesen tersebut telah dikeluarkan oleh ST.

Terdapat dua jenis pembeli - yang membeli gas daripada rangkaian penghantaran PGU (borong) dan juga yang membeli gas daripada rangkaian pengagihan (runcit). Pemborong kebanyakannya terdiri daripada pemborong daripada sektor tenaga, industri petrokimia, pengilang besar, pengekspot dan rangkaian pengagihan. Pasaran runcit kebanyakannya terdiri daripada pihak SME, pengilang sarung tangan getah dan besi keluli serta daripada segmen-segmen kediaman dan komersial.

Under the TPA system, licensed shippers have access to gas facility owned and operated by PGB (regasification terminals and transmission network) and GMD (distribution network). Previously, Petronas and Gas Malaysia were the exclusive suppliers of gas in the country, with Petronas serving the wholesale market and Gas Malaysia, the retail market. The 2016 amendment to the Gas Supply Act 1993, which came into effect on 16 January 2017, provides the legal framework for the TPA, which allows other licensed shippers to supply gas to the Malaysian gas market by accessing the existing gas facility. The licences are issued by the Commission.

There are two types of buyers – one that buys from the PGU transmission network (wholesale) and the other that buys from the distribution network (retail). Wholesale buyers comprise mainly from the power sector, petrochemical industry, large manufacturers, exporters and the distribution network. The retail market covers mainly SMEs, rubber gloves and steel manufacturers as well as the commercial and residential segments.

Ketibaan penghantaran LNG Pihak Ketiga yang pertama di RGTSU pada Oktober 2019 sebagai permulaan pelaksanaan TPA.
The arrival of the first Third Party shipment of LNG at the RGTSU in October 2019 marked the operationalisation of the TPA arrangement.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

PENGELUARAN LESEN GAS PERSENDIRIAN
ISSUANCE OF PRIVATE GAS LICENCES

Pada akhir Disember 2019, sebanyak 21 lesen telah dikeluarkan sempena pelaksanaan TPA.

As at end December 2019, a total of 21 licences were issued with the implementation of the TPA.

Lesen Gas TPA
Gas TPA Licences

Pengimportan ke Terminal Penggasan Semula Importation to Regasification Terminal	**Terminal Penggasan Semula** Regasification Terminal	**Pengangkutan** Transportation	**Pengagihan** Distribution	**Penghantaran** Delivery
Gaztech E&S Sdn Bhd	Pengerang LNG (TWO) Sdn Bhd	PETRONAS Gas Berhad	Sabah Energy Corporation Sdn Bhd	Gaztech E&S Sdn Bhd
TNB Fuel Services Sdn Bhd	Regas Terminal (Sg. Udang) Sdn Bhd	Trans Thai-Malaysia (Malaysia) Sdn Bhd	Malaysia Airports (Sepang) Sdn Bhd	TNB Fuel Services Sdn Bhd
B.B. Energy Malaysia Ltd		PRPC Utilities and Facilities Sdn Bhd		B.B. Energy Malaysia Ltd
Petrolife Aero Sdn Bhd		Pengerang Refining Company Sdn Bhd (formerly known as PRPC Refinery and Cracker Sdn Bhd)		Petronas Energy & Gas Trading Sdn Bhd
Petronas Energy & Gas Trading Sdn Bhd				Shell Malaysia Trading Sdn Bhd
Shell Malaysia Trading Sdn Bhd				Petrolife Aero Sdn Bhd
OCN Energy Resources Sdn Bhd				

LAIN-LAIN PENCAPAIAN
OTHER MILESTONES

Mekanisme myGREEN+ (Green Tariff Rider)

Pada Oktober 2019, Kerajaan telah memperkenalkan myGreen+, iaitu skim tarif premium bagi pelanggan yang ingin menggunakan tenaga hijau. myGreen+ memberi pelanggan pilihan untuk membeli tenaga hijau daripada sumber TBB tanpa pemasangan sistem penjanaan TBB sendiri.

Pelanggan myGreen+ dikehendaki membayar bil elektrik bulanan masing-masing berdasarkan tarif normal, dan tarif tambahan untuk tenaga hijau (*green premium*) pada kadar 8 sen/kWj sepanjang tempoh RP2 (2018-2020).

Pelaksanaan skim myGreen+ dijangka akan dapat meningkatkan lagi kemasukan TBB ke dalam negara ini dan menyumbang kepada pencapaian sasaran Malaysia untuk meningkatkan kapasiti terpasang TBB kepada 20% menjelang tahun 2025.

myGREEN+ Mechanism (Green Tariff Rider)

In October 2019, the Government introduced myGreen+, a premium tariff scheme for consumers wanting to use green energy. myGreen+ provides consumers the option of buying green energy from RE sources without having to install their own RE generation system.

myGreen+ subscribers are required to pay their monthly electricity bills based on conventional tariffs, and a green tariff rider (green premium) set at 8 sen/kWh for RP2 (2018-2020).

The implementation of the myGreen+ scheme is expected to boost RE intake in the country and contribute towards the achievement of Malaysia's target to increase RE installed capacity to 20% by 2025.

Ciri Utama myGreen+
Key Features of myGreen+

Perkara Item	**Butiran** Details
Kadar Rate	• Kadar myGreen+, juga dikenali sebagai kadar premium, ditentukan bagi setiap Tempoh Regulatori • Kadar bagi RP2 telah ditetapkan pada 8 sen/kWj • myGreen+ rate, also known as premium rate, is set at every Regulatory Period • The rate for the current RP2 has been set at 8 sen/kWh
Bil Bill	• Dikecualikan daripada surcaj dan rebat ICPT • Cukai perkhidmatan bagi langganan melebihi 600kWj (bagi pengguna Tarif A atau Domestik sahaja) • Dikecualikan daripada 1.6% sumbangan kepada KWTBB • Excluded from ICPT surcharges or rebates • Services tax for subscribers exceeding 600kWh (for consumers in Tariff A or Domestic only) • Excluded from the 1.6% contribution to KWTBB
Sijil Certificate	• Semua pengguna akan diberikan sijil sebagai pengiktirafan sokongan mereka terhadap agenda hijau kebangsaan • All consumers to be issued a certificate as recognition of their support for the national green agenda
Kuota Quota	• Jumlah pelanggan myGreen+ daripada segmen pengguna yang berlainan tidak boleh melebihi Kuota Hijau bulanan yang telah diperuntukkan oleh ST • All myGreen+ subscribers from different consumer segments cannot exceed the monthly Green Quota allocated by the Commission.

Dengan pelancaran myGreen+, Kuota Hijau sebanyak 37,267,230 kWj kini tersedia bagi pengguna yang ingin melanggan skim ini. Pengguna yang berminat boleh menyemak kuota tersedia dengan melayari laman web TNB ataupun portal myTNB. Mereka juga boleh melanggan skim ini dengan membeli tenaga hijau pada setiap blok 100kWj, namun langganan sebegini adalah terhad kepada pembelian TBB daripada kapasiti penjanaan tenaga solar yang sedia ada dalam sistem.

With the launch of myGreen+, a Green Quota of 37,267,230 kWh is available to consumers keen to subscribe to the scheme. Interested parties can check on the quota available by visiting the TNB website or myTNB portal. They can also subscribe to the scheme by buying green energy in 100kWh blocks, but such subscriptions are restricted to the purchase of RE from the existing solar power generation capacity in the system.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

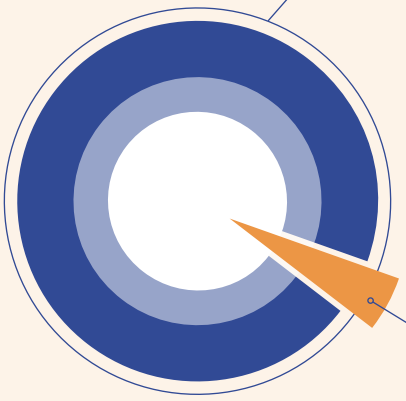
Sehingga hujung 2019, ST telah menerima sebanyak 44 langganan skim myGreen+ dengan jumlah penggunaan tenaga hijau sebanyak 1,016,100 kWj.

As at end 2019, the Commission had received 44 subscriptions for the myGreen+ scheme, for a total consumption of 1,016,100 kWh of green energy.

Kuota Tenaga Hijau myGreen+ sehingga 31 Disember 2019
myGreen+ Energy Quota as at 31 December 2019

Kuota Tersedia (kWj)
Available Quota (kWh)

36,618,530



1,016,100

Kuota Langganan (kWj)
Subscription Quota (kWh)

	Bil. Pelanggan Nos. of Subscribers	Jumlah kWj Total kWh
Pelanggan Tarif A Customer with Tariff A	36	81,900
Pelanggan Tarif B Customer with Tariff B	8	934,200
Jumlah Pelanggan Total Subscribers	**44**	**1,016,100**

- Kuota tersedia skim myGreen+ boleh dilihat di laman web TNB dan myTNB Portal
  The available quota for myGreen+ scheme can be viewed at TNB website and myTNB Portal

- Pelanggan boleh membeli tenaga hijau tanpa had dalam blok 100kWj berdasarkan kapasiti tenaga solar yang ada dalam sistem
  Customers can purchase green energy without limit in 100kWh blocks based on the available solar energy generation capacity in the system

- Untuk pelanggan yang tahap penggunaan bulanan adalah di bawah tahap langganan mereka selama tiga bulan berturut-turut, TNB akan mengeluarkan surat pemberitahuan dan mengemaskini myGreen+ dengan langganan baharu. Ini akan mengosongkan kuota untuk pelanggan lain.
  For customers whose monthly consumption level falls below their subscribed level for three consecutive months, TNB will issue notification letters and update new myGreen+ subscription. This would free up their quota for other subscribers.

Pelaksanaan skim myGreen+ memerlukan tambahan kos modal untuk operasi penghantaran, pengagihan, peruncitan dan pengendalian grid. ST telah memutuskan untuk mengekalkan jumlah kos modal yang telah diluluskan bagi tempoh RP2. Kos tambahan akan diambil kira semasa penetapan kos modal bagi Tempoh Regulatori Ketiga (RP3) dari 2021 sehingga 2023.

The implementation of the myGreen+ scheme will require additional capital costs for transmission, distribution, retailing and grid operations. The Commission decided to maintain the capital costs at the amount approved under RP2. Additional costs are to be taken into consideration when fixing capital costs for the Third Regulatory Period (RP3) from 2021 to 2023.

ENHANCING ECONOMIC EFFICIENCY AND AFFORDABILITY

Lain-lain Pencapaian

A. Projek Lampu Jalan LED

Pada 2019, Kementerian telah:

i. Meluluskan penyusunan semula perbelanjaan modal berjumlah RM623.90 juta di bawah RP2 bagi projek khas, iaitu pemasangan lampu jalan LED yang menyaksikan pengurangan kos sebenar bagi setiap unit yang telah menghasilkan penjimatan kos modal sebanyak RM237.39 juta.

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ii. Meluluskan cadangan untuk menambah lokasi-lokasi lampu jalan LED dengan menggunakan wang penjimatan sebanyak RM237.39 juta tersebut.

B. Diskaun Bil Elektrik bagi Taska yang Berdaftar

Pada 2019, Kerajaan telah memperkenalkan skim diskaun khas sebanyak 20% ke atas tarif komersial (Tarif B) bagi taska yang berdaftar di bawah Jabatan Kebajikan Masyarakat (JKM) bermula pada 1 November 2019 sehingga 31 Disember 2020.

Diskaun ini bertujuan menggalakkan pihak pengusaha dan pemilik taska untuk mendaftar dengan pihak JKM untuk membolehkan pemantauan operasi yang lebih berkesan.

Pada Ogos 2019, terdapat 4,744 buah taska yang telah berdaftar dengan JKM. Jumlah ini mewakili sekitar 11.9% daripada 40,000 buah pusat taska di Semenanjung Malaysia bagi kanak-kanak di bawah umur empat tahun.

C. Persiapan bagi RP3: Langkah-langkah Awal

Sebagai persediaan awal bagi RP3 yang bermula pada 2021, ST bercadang untuk melantik perunding pakar bidang kawal selia ekonomi untuk melaksanakan kajian menyeluruh merangkumi skop kerja seperti berikut:

i. Penilaian perbelanjaan modal dan operasi berhemah entiti bisnes TNB bagi tempoh RP2 dan RP3

ii. Audit akaun regulatori bagi tempoh RP2

iii. Semakan semula tarif asas elektrik TNB bagi tempoh RP3 yang menggunakan mekanisme IBR

Kajian ini dirancang dilaksanakan selama 15 bulan, bermula November 2019 sehingga Januari 2021, dan akan merangkumi sesi rundingan bersama pemegang-pemegang taruh terutamanya pengguna.

Other Highlights

A. LED Street Lighting Project

In 2019, the Ministry has:

i. Approved the restructuring of capital expenditure amounting to RM623.90 million under RP2 for a special project, which is the installation of LED streetlights that saw a reduction in actual cost per unit resulting in a savings of RM237.39 million in capital costs.

ii. Approved the proposal to increase the number of locations with LED streetlights by using the RM237.39 million saved.

B. Electricity Bill Discounts for Registered Childcare Centres

In 2019, the Government introduced a special discount scheme of 20% on commercial tariffs (Tariff B) for electricity charges at childcare centres registered with the Social Welfare Department (JKM) from 1 November 2019 to 31 December 2020.

The discount aims to encourage entrepreneurs and owners of childcare centres to register with JKM to enable it to monitor their operations more effectively.

As at August 2019, there were 4,744 childcare centres registered with JKM. This represents about 11.9% of 40,000 centres in Peninsular Malaysia, for children below four years.

C. Preparation for RP3: The Initial Steps

As an initial preparation for RP3 beginning 2021, the Commission plans to appoint a consultant specialising in economic regulation to implement a comprehensive study based on the following scope of work:

i. Valuation of prudent capital expenditure and operational expenditure of TNB's business entities during RP2 and RP3

ii. Audited regulatory accounts for RP2

iii. Review of TNB's base electricity tariff using the IBR mechanism for RP3

The study is planned over a period of 15 months, from November 2019 to January 2021, and includes consultations with stakeholders, especially consumers.

MENINGKATKAN KECEKAPAN EKONOMI DAN KEMAMPUAN

D. Caj Rangkaian Interim bagi Kontrak Hijau Pihak Ketiga

Untuk melaksanakan TPA kepada grid bagi penjana TBB, ST telah menyediakan caj rangkaian interim yang akan berkuatkuasa pada 2020.

Dua pilihan caj rangkaian telah dicadangkan. ST telah mencadangankan untuk pertimbangan dan kelulusan Kementerian penggunaan caj rangkaian interim bagi 2020 untuk lima projek perintis Kontrak Hijau Pihak Ketiga dengan kapasiti maksimum sebanyak 100MW sehingga tempoh RP3 berkuatkuasa.

Lain-lain Kontrak Hijau Pihak Ketiga adalah tertakluk kepada caj rangkaian berdasarkan mekanisme IBR.

E. Semakan Semula Terma Caj Sambungan Pengguna TNB

Pelanggan TNB dikehendaki membayar caj sambungan elektrik sebelum bekalan elektrik disambungkan. Ia adalah perbelanjaan yang tidak boleh dikutip melalui tarif elektrik dan dibenarkan di bawah Seksyen 27(2), Akta Bekalan Elektrik 1990.

Berdasarkan peruntukan ini, pihak TNB telah mengenakan caj sambungan kepada pengguna sejak tahun 1995.

Semakan caj sambungan merupakan salah satu inisiatif utama MESI 2.0 untuk dilaksanakan. Pada Ogos 2019, TNB telah mengemukakan cadangan untuk menyemak semula caj sambungan ini.

Setelah melalui pelbagai sesi perbincangan, termasuk sesi perundingan bersama pihak pengguna, ST telah meluluskan cadangan TNB pada Oktober 2019. Ianya kini sedang menunggu kelulusan Kementerian.

D. Interim Wheeling Charges for Third Party Green Contracts

To implement TPA to the Grid by RE producers, the Commission prepared interim wheeling charges to take effect in 2020.

Two options for wheeling charges have been proposed. The Commission has made a recommendation for consideration and approval by the Ministry, an interim network wheeling charge in 2020, to be applicable to five pilot projects trialed for Third Party Green Contracts that have a maximum capacity of 100MW until the RP3 takes effect.

Other Third Party Green Contracts will be subject to wheeling charges based on the IBR mechanism.

E. Review of the Terms of TNB's Customer Connection Charges

TNB requires its customers to pay electricity connection charges prior to supplying electricity. This is an expense that cannot be collected through the electricity tariff as stipulated under Section 27(2) of the Electricity Supply Act 1990.

Based on this provision, TNB has been charging consumers connection charges since 1995.

The revision of connection charges is one of the key initiatives to be implemented under MESI 2.0. In August 2019, TNB submitted a proposal for the review of this connection charge.

After various discussions, including consultations with consumers, the Commission approved TNB's proposal in October 2019. It is now subject to approval by the Ministry.

MELANGKAH KE HADAPAN: MESI 2.0
MOVING FORWARD: MESI 2.0

Liberalisasi Pasaran dan Tadbir Urus yang Kukuh Industri Pembekalan Elektrik dan Gas Berpaip

Pada September 2019, MESI 2.0 telah dilancarkan bagi melaksanakan pembaharuan yang akan memacu kecekapan rantaian bekalan elektrik dan gas negara. Pelan tindakan 10 tahun ini merupakan tindakan susulan daripada MESI 1.0 yang lebih tertumpu kepada penstrukturan semula industri. Pembaharuan MESI 2.0, disebaliknya pula, tertumpu kepada liberalisasi pasaran yang melibatkan industri dan juga pengguna.

Market Liberalisation and Robust Governance of the Electricity and Piped Gas Supply Industry

In September 2019, MESI 2.0 was launched for the implementation of reforms to drive greater efficiency across the electricity and gas supply chain in the country. This 10-year road map is a follow-up of MESI 1.0 that focused on the restructuring of the industry. MESI 2.0 reforms, on the other hand, are focused on market liberalisation that will involve the industry as well as consumers.

Lima Inisiatif Utama di bawah MESI 2.0
Five Key Initiatives under MESI 2.0

1. Mewujudkan perolehan bahan api terbuka
   Establishment of open fuel sourcing
2. Membangunkan pasaran borong hibrid
   Development of a hybrid wholesale market
3. Memudahkan TPA kepada grid penghantaran dan pengagihan
   Facilitating TPA to the transmission and distribution grid
4. Memudahkan pilihan dalam pasaran runcit melalui pembangunan rangka kerja bagi persaingan runcit
   Facilitating choice in the retail market by developing a framework for retail competition
5. Meningkatkan ketelusan dan mengurangkan konflik kepentingan dalam mekanisme Pembeli Tunggal dan Pengendali Perkhidmatan Grid
   Increasing transparency and reducing conflict of interest in the Single Buyer and Grid Service Operator mechanisms

Kerajaan telah melantik MyPOWER bagi mengurus MESI 2.0 dan mengkaji kebolehlaksanaan inisiatif-inisiatif terlibat. Kajian yang diluluskan akan dilaksanakan oleh ST selaku agensi pelaksana. ST juga bertanggungjawab untuk membangunkan jadual caj rangkaian bagi akses pihak ketiga kepada grid.

Bagi kelima-lima inisiatif tersebut, ST akan menilai dan membangunkan rangka kerja kawal selia yang sesuai bagi membolehkan pelaksanaan dilakukan mengikut garis masa yang telah ditetapkan.

The Government appointed MyPOWER to manage MESI 2.0 and conduct studies on the feasibility of the initiatives. The approved studies will be executed by the Commission as the implementation agency. The Commission will be responsible for developing the schedule of network charges for third parties to have access to the grid.

For the five initiatives, the Commission will review and develop appropriate regulatory frameworks to enable its implementation according to pre-determined timelines.

BAB 05
CHAPTER 05

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

ST mengawal selia dan memantau prestasi dan kecekapan industri elektrik dan gas berpaip untuk memastikan ianya adalah selamat, berdaya harap dan dinamik. Bagi tujuan ini, ST sentiasa mengukuhkan kecekapan dalam organisasi serta pelaksanaan perkhidmatan melalui proses-proses inovatif supaya tetap kekal responsif dan relevan kepada keperluan industri.

The Commission regulates and monitors the electricity and piped gas industry to ensure its performance, competency, and dynamism. To this end, it is continuously strengthening its internal organisational competencies and service delivery with innovative processes to remain responsive and relevant to the needs of the industry.

SOROTAN 2019
2019 HIGHLIGHTS

- Pendaftaran Pemeteran Tenaga Bersih (NEM) *t*elah meningkat dengan ketara seiring dengan pembaharuan dasar-dasar Kerajaan untuk menarik lebih banyak penjana tenaga solar.
- Pengeluaran lesen gas persendirian meningkat sebanyak 112.29%, berikutan dengan pelaksanaan sistem Akses Pihak Ketiga (TPA) yang telah meliberalisasikan pasaran gas.
- Sejumlah 977 Perakuan Kelulusan (CoA) bagi peralatan elektrik telah dibatalkan setelah gagal melepasi Ujian Konsainmen SIRIM.
- Permohonan bagi Kelulusan Untuk Memasang (ATI) dan Kelulusan Untuk Mengendali (ATO) sistem gas berpaip masing-masing telah meningkat sebanyak 46.74% dan 50.79% disebabkan oleh permintaan komersial, terutamanya daripada kedai-kedai dobi.
- ST telah memperolehi skor sebanyak 86.80% dalam Indeks Kepuasan Pengguna (2018: 79.69%); ia juga berjaya mengekalkan pensijilan ISO 9001: 2015 Sistem Pengurusan Kualiti selepas menjalani audit mandatori.
- ST telah menjalankan Analisa Impak Risiko (RIA) dari bulan Julai hingga September ke atas cadangan Akta Kecekapan Tenaga dan Konservasi, untuk mendapatkan maklumbalas daripad Kabinet, pihak perundangan, industri, sektor korporat, persatuan-persatuan dan institusi pengajian, sebelum penggubalan rang undang-undang tersebut.
- ST telah melancarkan laman mikro untuk Aduan Pengguna ST pada bulan Julai 2019.

- Net Energy Metering (NEM) registrations grew rapidly in line with the Government's policy revisions to attract more solar energy producers.
- Issuance of private gas licences increased by 112.29%, which was attributed to the implementation of the Third Party Access (TPA) system that liberalised the gas marketplace.
- 977 Certificates of Approval (CoA) for electrical equipment were cancelled because they failed the SIRIM Consignment Test.
- Applications for Approval to Install (ATI) and Approval to Operate (ATO) piped gas systems grew by 46.74% and 50.79% respectively due to commercial demand, especially from launderettes.
- The Commission scored 86.80% in the Customer Satisfaction Index (2018: 79.69%); it also maintained its ISO 9001: 2015 Quality Management System certification after the mandatory audits.
- The Commission instigated the Risk Impact Analysis (RIA) from July to September on the proposed Energy Efficiency and Conservation Act, to gather feedback from the Cabinet, law makers, industry, corporate sector, associations and educational institutions, prior to the drafting of the bill.
- The Commission launched the online ST Consumer Complaints microsite in July 2019.

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

PEMBANGUNAN INSTRUMEN PERUNDANGAN KAWAL SELIA

THE DEVELOPMENT OF REGULATORY INSTRUMENTS

Pada 2019, ST terus melaksanakan pelbagai inisiatif yang berkaitan dengan undang-undang bekalan tenaga dalam usaha untuk mengikuti perkembangan semasa dan kemajuan teknologi dalam industri bekalan tenaga. Inisiatif-inisiatif ini meliputi pembangunan Garis Panduan dan Panduan baharu untuk memastikan undang-undang pembekalan tenaga kekal relevan, bermanfaat, dan mantap dalam pengawalseliaan industri bekalan tenaga.

Garis Panduan menguraikan prosedur wajib dan keperluan lain yang diperuntukkan di bawah Akta Bekalan Elektrik 1990 dan Akta Bekalan Gas 1993, atau perubahan yang diperlukan untuk pelaksanaan yang lebih baik di bawah Akta tersebut. Setelah didaftarkan dengan ST, Garis Panduan ini wajib dipatuhi oleh para pemegang taruh dan sebarang ketidakpatuhan terhadapnya adalah suatu kesalahan di bawah undang-undang yang berkenaan.

Manakala Panduan pula merupakan dokumen rujukan oleh pemegang taruh mengenai prosedur atau proses kerja dan tidak mempunyai peranan perundangan.

Berikut adalah senarai Garis Panduan dan Panduan yang telah dibangunkan dan dikeluarkan oleh Suruhanjaya pada tahun 2019.

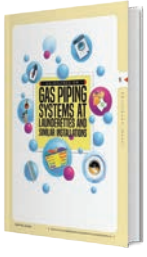
In 2019, the Commission continues to pursue various initiatives related to energy supply laws in its endeavors to keep abreast of current practices and technological advances in the energy supply industry. These initiatives include the development of new Guidelines and Guides to ensure the energy supply laws remain relevant, beneficial, and robust in regulating the energy supply industry.

Guidelines will outline mandatory procedures and other requirements provided under the Electricity Supply Act 1990 and the Gas Supply Act 1993, or necessary modifications for better implementation of the provisions under the Acts. All Guidelines, after being registered with the Commission, shall legally bind the stakeholders and any non-compliance with these Guidelines shall be an offence under the respective laws.

Meanwhile, Guides are documents that serve as a reference on matters related to legislation. Guides are not legally binding as they act as a reference by stakeholders to procedures or work processes for related matters.

The following is the list of guidelines and guides that have been developed and issued by the Commission in 2019.

1 Guidelines on Gas Piping System at Launderettes and Similar Installations



Garis Panduan ini di bangunkan sebagai panduan kepada perunding, kontraktor gas, pemilik dobi atau pemilik francais dobi, Orang Kompeten dan pemilik premis atau syarikat pengurusan hartanah dalam mengurus dan menyelenggara sistem perpaipan gas di premis dobi dan premis yang mempunyai pemasangan serupa.

These Guidelines were developed to provide guidance to consultants, gas contractors, laundrette owners or launderette franchise owners, competent persons and premise owners or property management companies in managing and maintaining gas piping systems at launderette premises and other premises with similar installations.

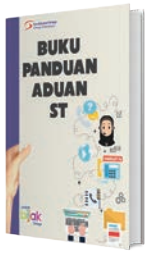
IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

2 Guidelines on Advanced Metering Infrastructure

Garis Panduan ini di bangunkan untuk menetapkan syarat-syarat yang harus dipenuhi oleh pemegang lesen dan pembekal meter pintar dalam memperkenalkan teknologi pemeteran elektrik baharu. Ini meliputi syarat-syarat dalam pembekalan dan penggunaan meter pintar serta menguraikan peranan dan kewajiban pihak-pihak yang berkenaan.

These Guidelines were developed to set out the requirements that need to be met by licensees and smart meter suppliers in introduction of the new electrical metering technology. It encompasses the requirements in the supply and use of the smart meter as well as outlining the roles and obligations of the relevant parties.

3 Buku Panduan Aduan ST



Panduan ini di bangunkan sebagai panduan kepada pengguna mengenai prosedur, proses, dan cara untuk mengajukan aduan kepada ST mengenai hal-hal yang berkaitan dengan perkhidmatan yang di kawalselia oleh ST.

This guide was developed to provide guidance to consumers on the procedures, processes, and ways to lodge a complaint to the Commission on matters relating to services regulated by the Commission.

4 Guide on Minimum Energy Performance Standards (MEPS) for Television

Panduan ini di bangunkan untuk menetapkan tahap kecekapan tenaga dan keperluan pelabelan tenaga untuk televisyen yang dapat disambungkan ke kuasa utama dan juga untuk keperluan domestik. Ini memberikan piawaian pengujian baharu iaitu MS IEC 62087-1, -2, -3: 2017 sebagai panduan untuk penilaian bintang dan nilai kecekapan tenaga baharu untuk televisyen.

This Guide was developed to set the level of energy efficiency and energy labelling requirements on televisions that can be connected to the main power as well as for domestic use. It provides the new testing standards used, which is the MS IEC 62087-1, -2, -3:2017 as guidance for star rating and the new energy efficiency values for televisions.

5 Guide on Issuance of Certificate of Approvals and Labelling of Domestic Gas Cooking Appliances

Panduan Mengeluarkan Perakuan Kelulusan dan Pelabelan Peralatan Memasak Gas Domestik di bangunkan untuk membolehkan pengguna membezakan antara peralatan gas domestik yang diluluskan dan yang tidak diluluskan. Penerbitan ini menekankan pentingnya membeli peralatan gas yang telah diluluskan oleh ST dan dilekatkan dengan label SIRIM-ST.

The Guide on Issuance of Certificate of Approvals and Labelling of Domestic Gas Cooking Appliances was developed to enable consumers to differentiate between the approved and non-approved regulated domestic gas appliances. The publication highlights the importance of purchasing gas appliances that have been approved by the Commission and affixed with a SIRIM-ST label.

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

PELESENAN DAN PERAKUAN
LICENSING AND CERTIFICATION

Pelesenan dan perakuan adalah instrumen kawal selia yang dikeluarkan oleh ST bagi memastikan keberterusan industri bekalan elektrik dan gas berpaip. Pemegang lesen dan perakuan dikehendaki mematuhi syarat-syarat yang ditetapkan dalam lesen atau perakuan masing-masing. Semua aktiviti yang dijalankan oleh pemegang lesen adalah dikawalselia oleh ST.

Licensing and certification are regulatory instruments issued by the Commission to ensure the safety of the electricity and piped gas industry. Licences and certificate holders are required to comply with the stipulated requirements of their licences or certificates. All activities of licensees are regulated by the Commission.

Perakuan dan Penguatkuasaan
Certification and Enforcement

i. Pendaftaran kontraktor
ii. Pendaftaran Orang Kompeten
iii. Pendaftaran pepasangan elektrik
iv. Pendaftaran pepasangan pagar elektrik
v. Pendaftaran lesen persendirian
vi. Peperiksaan kekompetenan
vii. Pemeriksaan (pepasangan elektrik dan gas, pelesenan dan pemantauan Orang Kompeten di pepasangan)

i. Registration of contractors
ii. Registration of Competent Persons
iii. Registration of electrical installations
iv. Registration of electrical fence installations
v. Registration of private licences
vi. Competency examinations
vii. Inspections (electricity and gas installations, licensing and monitoring of Competent Persons at installations)

Pencegahan, Penguatkuasaan dan Penyiasatan
Prevention, Enforcement and Investigation

i. Kempen dan dialog berkaitan keselamatan elektrik dan kecekapan tenaga
ii. Audit pengurusan keselamatan elektrik dan gas
iii. Penguatkuasaan dan penyiasatan terhadap penyalahgunaan elektrik
iv. Penguatkuasaan dan penyiasatan pepasangan elektrik dan gas serta kelengkapan elektrik yang gagal mematuhi undang-undang
v. Penyiasatan ke atas kemalangan elektrik, kebakaran dan pengendalian aduan-aduan berkaitan industri bekalan elektrik
vi. Pemeriksaan kelengkapan elektrik

i. Campaigns and dialogues related to electrical safety and energy efficiency
ii. Electrical and gas safety management audits
iii. Enforcement and investigation of electricity misconduct
iv. Enforcement and investigation of electrical and gas installations and electrical appliances that fail to comply with the law
v. Investigation of electrical accidents, fires and handling of complaints related to the electricity supply industry
vi. Inspection of electrical appliances

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Sepanjang 2019, ST telah mengeluarkan 3,971 lesen persendirian di bawah kapasiti 5MW (2018: 3,895 lesen) dan 10,603 pendaftaran pepasangan elektrik (2018: 10,123 pendaftaran). Selain daripada itu, sejumlah 3,240 pendaftaran kontraktor telah dikeluarkan (2018: 3,771 kontraktor) dan 22,293 Orang Kompeten (2018: 22,239 Orang Kompeten) telah dipertanggungjawabkan untuk memastikan keselamatan pepasangan elektrik dan gas.

Secara keseluruhannya, Selangor dan Wilayah Persekutuan (Kuala Lumpur dan Putrajaya) telah mencatat jumlah pendaftaran yang tertinggi bagi ketiga-tiga kategori tersebut. Ini adalah kerana lokasi-lokasi ini turut mempunyai penumpuan aktiviti industri dan komersial yang tertinggi.

Lesen Persendirian bagi Pepasangan di bawah 5MW

Daripada sejumlah 3,971 lesen persendirian yang dikeluarkan bagi pepasangan di bawah 5MW, kawasan Pantai Timur Sabah mencatat bilangan pemegang lesen tertinggi, iaitu sebanyak 1,163 pemegang lesen (2018: 945 pemegang lesen) iaitu 29.29% daripada jumlah keseluruhan. Ini diikuti oleh Johor dengan 522 pemegang lesen baharu, iaitu 13.90% daripada jumlah keseluruhan, Terengganu dengan 340 (8.56%) dan Selangor 332 (8.39%).

Pantai Timur Sabah

Di Sabah, permohonan untuk lesen baharu meningkat sebanyak 107.03% kepada 265 lesen (2018: 128 lesen baharu), dengan permintaan meliputi syarikat-syarikat telekomunikasi dan ladang kelapa sawit.

Syarikat telekomunikasi memerlukan sebanyak 64 set janakuasa diesel dengan kapasiti antara 8.5kW hingga 17kW untuk memancar kuasa kepada menara telekomunikasi. Terdapat juga permintaan untuk set janakuasa dalam sektor perladangan, terutamanya ladang kelapa sawit yang terletak di kawasan terpencil di luar grid yang memerlukan set berkapasiti 5kW hingga 3,300kW. Permintaan dari ladang kelapa sawit adalah berkaitan dengan keperluan pensijilan MSPO (*Malaysian Sustainable Palm Oil*) dan RSPO (*Roundtable on Sustainable Palm Oil*).

Sebahagian besar daripada lesen-lesen baharu (63.1%) adalah untuk pepasangan di bawah 100kW.

In 2019, the Commission issued 3,971 private licences below 5MW capacity (2018: 3,895 licences) and registered 10,603 electrical installations (2018: 10,123 registrations). Other than that, a total of 3,240 contractor registrations have been issued (2018: 3,771 contractors) and 22,293 Competent Persons (2018: 22,239 Competent Persons) entrusted with the safety of electrical and gas installations.

Overall, Selangor and the Federal Territories (Kuala Lumpur and Putrajaya) recorded the highest number of registrations in these three categories. This is because these locations also have the highest concentration of industrial and commercial activities.

Private Licences for Installations below 5MW

Out of the 3,971 private licences issued for installations below 5MW, the East Coast of Sabah recorded the highest number of licensees, with 1,163 licensees (2018: 945 licensees) which constitute 29.29% of the overall total. This was followed by Johor that had 522 new licensees which is 13.90% of the overall total, Terengganu recorded 340 (8.56%) and Selangor 332 (8.39%).

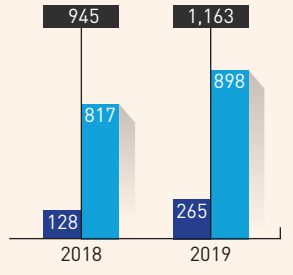
East Coast Sabah

In Sabah, applications for new licences increased by 107.03% to 265 licences (2018: 128 new licences), with demand coming from telecommunication companies and oil palm estates.

Telecommunication companies required 64 diesel generator sets of between 8.5kW to 17kW to transmit power to telecommunication towers. There was also a demand for generator sets in agriculture, especially oil palm estates located in remote off-grid areas that required 5kW to 3,300kW capacity sets. Demand from the oil palm estates were related to the certification requirements of the MSPO (Malaysian Sustainable Palm Oil) and RSPO (Roundtable on Sustainable Palm Oil).

The majority of new licences (63.1%) were for installations below 100kW.

Aktiviti Hasil: Pantai Timur Sabah
Activity Results: East Coast Sabah



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Johor

Dengan Kompleks Bersepadu Pengerang hampir siap, permintaan baharu untuk kuasa di tapak projek tersebut turut menurun. Ini juga telah menyebabkan penurunan dalam pengeluaran lesen persendirian yang mencatatkan sebanyak 522 lesen (2018: 1,245 lesen). Terdapat juga penurunan dalam pembaharuan lesen kerana tenaga masih mencukupi untuk mengekalkan bekalan di kawasan tapak projek yang masih aktif.

Terengganu

Di Terengganu, terdapat peningkatan bilangan pendaftaran lesen secara keseluruhan sebanyak 134% ke 340 lesen (2018: 145 lesen). Hampir kesemuanya adalah permohonan baharu.

Jumlah lesen persendirian baharu meningkat kepada 292 lesen (2018: 73 lesen). Peningkatan yang ketara ini boleh dikaitkan dengan kerja-kerja *turnaround* dan *shutdown* di hampir keseluruhan pepasangan milik Petronas di kawasan Paka dan Kerteh yang memerlukan penggunaan set janakuasa mudahalih.

Sementara itu, penguatkuasaan secara berterusan menyaksikan pengeluaran notis-notis amaran kepada pemilik pepasangan Petronas dan syarikat-syarikat yang terlibat dalam pembekalan kuasa. Ini menyebabkan peningkatan pendaftaran baharu secara mendadak.

Pembaharuan lesen telah menurun sebanyak 33% kepada 48 lesen (2018: 72 lesen) berikutan kerja-kerja yang telah siap di beberapa tapak projek.

Selangor

Di Selangor, pelesenan persendirian telah meningkat sebanyak 18% kepada 332 lesen (2018: 281 lesen). Pelesenan baharu meningkat sedikit kepada 244 lesen (2018: 239 lesen) sementara pembaharuan meningkat hampir dua kali ganda kepada 88 lesen (2018: 42 lesen) dengan permintaan daripada projek MRT 3 dan tapak-tapak kilang di Pelabuhan Klang.

Johor

With the Pengerang Integrated Complex nearing completion, demand for power at the project site also declined. This reduced the issuance of private licences, recorded at 522 licences (2018: 1,245 licences). There was also a decline in licence renewals as there was adequate power to maintain supply in the remaining active project sites.

Terengganu

In Terengganu, there was an overall growth in registrations that increased by 134% to 340 licences (2018: 145 licences). This came almost entirely from new applications.

The number of new private licences grew to 292 licences (2018: 73 licences). The sharp increase can be attributed to the turnaround and shutdown works at almost all Petronas-owned installations in the Paka and Kerteh area that required the use of portable generator sets.

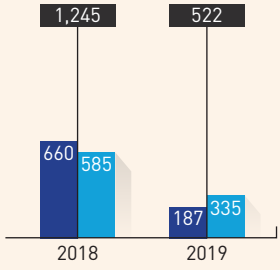
In the meantime, ongoing enforcement saw warning notices issued to owners of Petronas installations and companies engaged in power supply. This resulted in the sudden surge of new registrations.

Licence renewals declined by 33% to 48 licences (2018: 72 licences) following the completion of works at some project sites.

Selangor

In Selangor, private licences grew by 18% to 332 licences (2018: 281 licences). New licences increased marginally to 244 licences (2018: 239 licences) while renewals nearly doubled to 88 licences (2018: 42 licences) with demand generated by the MRT 3 project and factory sites in Port Klang.

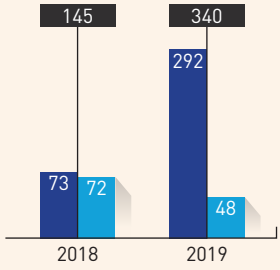
Aktiviti Hasil: Johor
Activity Results: Johor



Lesen Baharu
New Licences

Pelesenan Semula
Licence Renewals

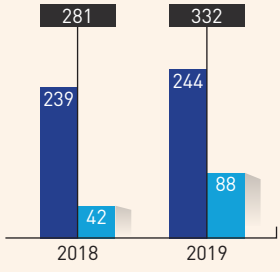
Aktiviti Hasil: Terengganu
Activity Results: Terengganu



Lesen Baharu
New Licences

Pelesenan Semula
Licence Renewals

Aktiviti Hasil: Selangor
Activity Results: Selangor



Lesen Baharu
New Licences

Pelesenan Semula
Licence Renewals

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Pendaftaran mengikut Negeri, 2018 dan 2019
Registration by State, 2018 and 2019

Negeri State	Pelesenan Persendirian (Bawah 5MW) Private Licences (Below 5MW)	
	2018	2019
Perlis	1	1
Kedah	70	56
Pulau Pinang	35	30
Perak	126	132
Selangor	281	332
Wilayah Persekutuan & Putrajaya	371	413
Negeri Sembilan	61	96
Melaka	136	352
Johor	1,245	522
Kelantan	46	57
Terengganu	145	340
Pahang	299	317
Pantai Barat Sabah	134	160
Pantai Timur Sabah	945	1,163
Jumlah Total	**3,895**	**3,971**

Pendaftaran Pepasangan Elektrik

Secara keseluruhannya, ST telah mendaftarkan sejumlah 10,603 pepasangan elektrik pada 2019 (2018: 10,123 pepasangan) yang terdiri daripada 1,563 permohonan baharu dan 9,040 pembaharuan. Selangor telah mencatatkan pendaftaran tertinggi dengan jumlah 2,324 pendaftaran, diikuti Wilayah Persekutuan (Kuala Lumpur dan Putrajaya) dengan 1,592 pendaftaran, dan Johor 1,357 pendaftaran.

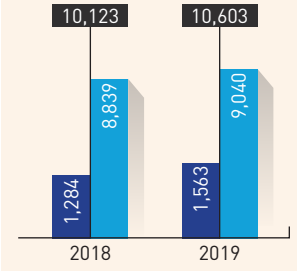
Peningkatan dalam pendaftaran adalah disebabkan oleh penguatkuasaan terma dan syarat lesen yang konsisten. Di Selangor, terdapat peningkatan pembaharuan lesen disebabkan oleh lesen-lesen yang tamat tempoh sah di sepanjang 2019.

Registration of Electrical Installations

Overall, the Commission had registered a total of 10,603 electrical installations in 2019 (2018: 10,123 installations) which was made up of 1,563 new applications and 9,040 renewals. Selangor recorded the highest registrations with 2,324, followed by the Federal Territories (Kuala Lumpur and Putrajaya) with 1,592, and Johor with 1,357 registrations.

The growth in registrations was due to the rigorous enforcement of the terms and conditions of licences. In Selangor, there was an increase in renewals as many licences had expired in 2019.

Aktiviti Hasil: Pendaftaran Pepasangan Elektrik
Activity Results: Registration of Electrical Installations



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Pendaftaran Pepasangan Mengikut Negeri, 2018 dan 2019
Registration of Installations by State, 2018 and 2019

Negeri State	Pendaftaran Pepasangan Registration of Installations	
	2018	2019
Perlis	55	54
Kedah	413	500
Pulau Pinang	1,144	1,252
Perak	768	820
Selangor	2,044	2,324
Wilayah Persekutuan & Putrajaya	1,584	1,592
Negeri Sembilan	438	364
Melaka	307	279
Johor	1,209	1,357
Kelantan	182	156
Terengganu	206	206
Pahang	460	434
Pantai Barat Sabah	714	645
Pantai Timur Sabah	599	620
Jumlah Total	**10,123**	**10,603**

Pendaftaran Kontraktor

Akta Bekalan Elektrik 1990 menetapkan pendaftaran enam jenis kontraktor.

i. Kontraktor Perkhidmatan Elektrik
ii. Kontraktor Elektrik
iii. Kontraktor Papan Tanda Elektrik
iv. Kontraktor Pembaikan Elektrik
v. Pengilang Papan Suis
vi. Unit Pendawaian Persendirian

Pada 2019, ST telah mendaftar sejumlah 3,240 kontraktor (2018: 3,771 kontraktor) dalam kategori-kategori seperti di atas, yang menunjukkan penurunan sebanyak 14% bagi jumlah pendaftaran. Kontraktor elektrik merangkumi sebanyak 66% daripada keseluruhan pendaftaran pembaharuan dan 34% daripada permohonan baharu.

Registration of Contractors

The Electricity Supply Act 1990 stipulates the registration of six types of contractors.

i. Electrical Services Contractor
ii. Electrical Contractor
iii. Electrical Billboard Contractor
iv. Electrical Repair Contractor
v. Switchboard Manufacturers
vi. Private Wiring Units

In 2019, the Commission registered 3,240 contractors (2018: 3,771 contractors) in the abovementioned categories, representing a 14% decline in the total number of registrations. Electrical contractors accounted for 66% of the overall renewal of registrations and 34% of new applications.

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Bilangan Pendaftaran Kontraktor berdasarkan Permohonan pada 2019
Number of Contractor Registrations based on Applications in 2019

Jenis Kontraktor Type of Contractor	**Kategori Kelas / Voltan** Category Class / Voltage	**Pendaftaran Baharu / Perubahan Kelas / Voltan** New Registration / Change of Class / Voltage	**Pendaftaran Semula** Renewal of Registration	**Pembaharuan** Renewal	**Jumlah** Total
Kontraktor Elektrik Electrical Contractor	A	59	72	318	449
	B	86	33	122	241
	C	507	474	1,113	2,094
	D	112	33	62	207
	JUMLAH	**764**	**612**	**1,615**	**2,991**
Kontraktor Pembaikan Elektrik Electrical Repair Contractor	-	8	20	49	77
Kontraktor Perkhidmatan Elektrik Electrical Services Contractor	11 KV	2	2	7	11
	33 KV	5	4	22	31
	132 KV	3	0	7	10
	275 KV	5	2	4	11
	500 KV	0	0	5	5
	JUMLAH	**15**	**8**	**45**	**68**
Pengilang Papan Suis Switchboard Manufacturer	0.600 KV	9	13	65	86
	11 KV	0	0	3	3
	33 KV	0	0	8	8
	JUMLAH	**9**	**13**	**76**	**98**
Kontraktor Papan Tanda Eletkrik Electrical Billboard Contractor	-	0	1	2	3
Unit Pendawaian Persendirian Private Wiring Unit	-	1	0	2	3
Jumlah Keseluruhan Overall Total		**797**	**654**	**1,789**	**3,240**

Pendaftaran Orang Kompeten

Orang Kompeten Elektrik dan Gas memainkan peranan yang penting dalam usaha untuk mengurangkan bilangan kemalangan elektrik. Di Malaysia, Orang Kompeten mesti memiliki Perakuan Kekompetenan yang dikeluarkan oleh ST.

Pada 2019, seramai 22,293 Orang Kompeten telah didaftar (2018: 22,239 Orang Kompeten).

Johor mencatatkan peningkatan yang tertinggi, dari 2,310 pada 2018 kepada 2,801 pada 2019; diikuti oleh kawasan Pantai Barat Sabah, daripada seramai 1,366 kepada 1,548 Orang Kompeten. Ini adalah hasil daripada pepasangan elektrik baharu yang telah bermula operasi dan aktiviti penguatkuasaan yang kerap dilakukan di negeri-negeri tersebut.

Wilayah Persekutuan Kuala Lumpur dan Putrajaya mencatat penurunan dalam pendaftaran, dengan 1,994 Orang Kompeten (2018: 2,348 Orang Kompeten). Ini disebabkan oleh penurunan pepasangan elektrik baharu. Satu lagi faktor adalah sesetengah permohonan yang didaftar pada 2018 mempunyai tempoh sah laku yang melebihi satu tahun.

Registration of Competent Persons

Electrical and Gas Competent Persons play a pivotal role in the ongoing effort to reduce the number of electrical accidents. In Malaysia, Competent Persons must have Competency Certificates issued by the Commission.

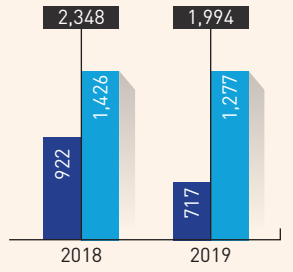
In 2019, there were 22,293 Competent Persons registered (2018: 22,239 Competent Persons).

Johor recorded the highest increase, from 2,310 in 2018 to 2,801 in 2019; followed by the West Coast of Sabah, from 1,366 to 1,548 Competent Persons. This is the outcome of new electrical installations becoming operational and frequent enforcement activities in these states.

The Federal Territory of Kuala Lumpur and Putrajaya recorded fewer registrations, with 1,994 Competent Persons (2018: 2,348 Competent Persons). This was due to fewer new electrical installations. Another factor is that some applications registered in 2018 were for a period of more than one year.

Pendaftaran Orang Kompeten, Wilayah Persekutuan
Registration of Competent Persons, Federal Territory

Aktiviti Hasil: Wilayah Persekutuan
Activity Results: Federal Territory



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Pendaftaran Orang Kompeten Mengikut Negeri, 2018 dan 2019
Registration of Competent Persons by State, 2018 and 2019

Negeri State	2018	2019
Perlis	171	167
Kedah	1,115	1,350
Pulau Pinang	1,649	1,716
Perak	2,525	2,483
Selangor	4,899	4,284
Wilayah Persekutuan & Putrajaya	2,348	1,994
Negeri Sembilan	803	892
Melaka	1,041	994
Johor	2,310	2,801
Kelantan	969	866
Terengganu	1,041	956
Pahang	1,410	1,661
Pantai Barat Sabah	1,366	1,548
Pantai Timur Sabah	592	581
Jumlah Total	**22,239**	**22,293**

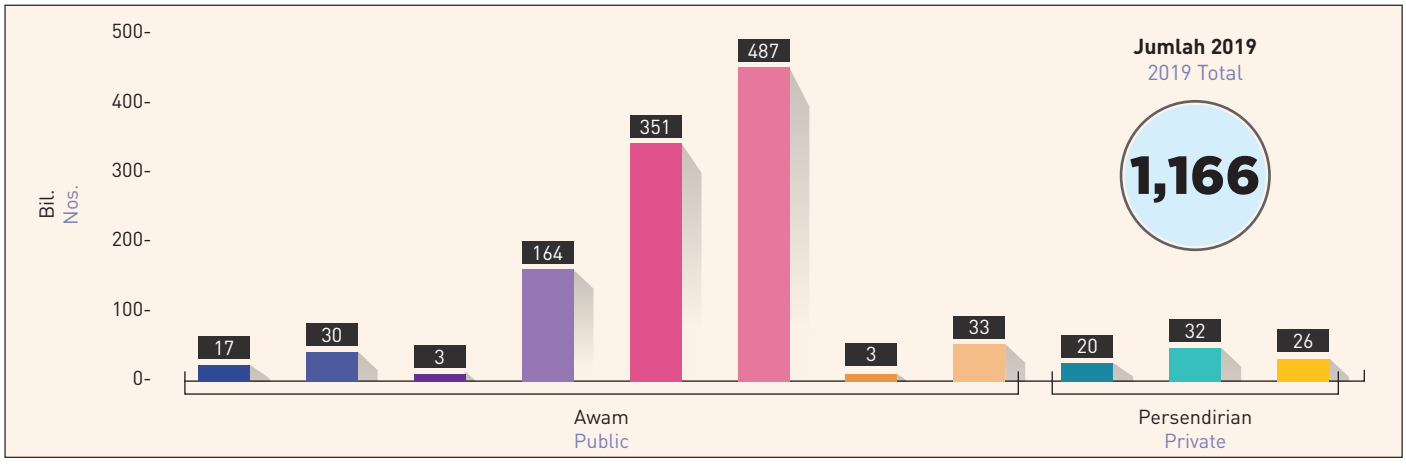
Pendaftaran Pepasangan Elektrik Melebihi 5MW

Setakat 2019, ST telah mengeluarkan sebanyak 1,166 lesen awam dan persendirian bagi pepasangan elektrik melebihi 5MW mengikut Seksyen 9 di bawah Akta Bekalan Elektrik 1990. Daripada jumlah ini, sebanyak 1,088 lesen (93.3%) adalah untuk pepasangan awam, dan selainnya adalah untuk premis persendirian. Pada keseluruhannya, terdapat 11 kategori lesen.

Registration of Electrical Installations Exceeding 5MW

As of 2019, the Commission had issued 1,166 public and private licences for electrical installations exceeding 5MW in accordance with Section 9 of the Electricity Supply Act 1990. Of this, 1,088 licences (93.3%) were for public installations, and the remaining were for private establishments. Overall, there are 11 licence categories altogether.

Jumlah Lesen mengikut Kategori setakat 2019
Total Licences by Category as at 2019



IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Di sepanjang 2019, sebanyak 215 lesen telah dikeluarkan (2018: 145 lesen), yang mencerminkan peningkatan sebanyak 48%.

Salah satu penyumbang terbesar adalah peningkatan mendadak 237% bagi pendaftaran NEM iaitu sebanyak 125 lesen (2018: 37 lesen). Ini adalah hasil daripada dasar baharu Kerajaan untuk menarik lebih banyak penyertaan pihak persendirian di dalam NEM. Ia melibatkan pembaharuan dalam kaedah pembayaran bagi tenaga solar yang dihasilkan oleh penjanaan NEM. Daripada bayaran secara *displacement costs* kepada syarikat utiliti kebangsaan TNB, penjana NEM dibenarkan menggunakan kaedah bayaran *one-to-one* mulai 1 Januari 2019. Ini berikutan pelarasan tarif antara kedua-dua penjana kuasa; pada 2018, penjana NEM menggunakan tarif yang lebih rendah daripada TNB.

Di samping itu, aktiviti promosi yang dilaksanakan oleh Kerajaan telah menarik lebih ramai pihak supaya memasang solar PV untuk menjana elektrik bagi penggunaan sendiri dan untuk penjualan.

Keputusan untuk menamatkan insentif *Feed-in Tariff* bagi solar PV telah menyebabkan penurunan pendaftaran lesen Tenaga Boleh Baharu (TBB) kepada 14 lesen pada 2019 (2018: 25 lesen). Bermula pada 2019, *Feed-in Tariff* akan dihadkan kepada penjanaan berasaskan biogas, biomas, hidro mini dan tenaga geoterma.

Dua lesen Penjana Bebas (IPP) telah dikeluarkan sepanjang tahun yang sama - untuk Jimah East Power Sdn Bhd dan Southern Power Generation Sdn Bhd. Pada 2018, tiada lesen IPP dikeluarkan.

Bilangan lesen pengagihan telah menurun pada 2019 kepada 37 lesen (2018: 49 lesen). Ini disebabkan oleh pengenalan kriteria baharu dan pemprosesan permohonan yang lebih ketat.

In 2019, 215 licences were issued (2018: 145 licences), reflecting an increase of 48%.

One of the biggest contributors was the 237% surge in NEM registrations that grew to 125 licences (2018: 37 licences). This is the outcome of the new Government policy to attract greater private participation in NEM. It saw the revision in the payment method for solar energy produced by NEM generators. Instead of displacement costs to be paid to the national utility company TNB, NEM generators could pay using a one-to-one payment method effective 1 January 2019. This follows the rationalisation of tariffs between both power producers; in 2018, NEM generators had a lower tariff than TNB.

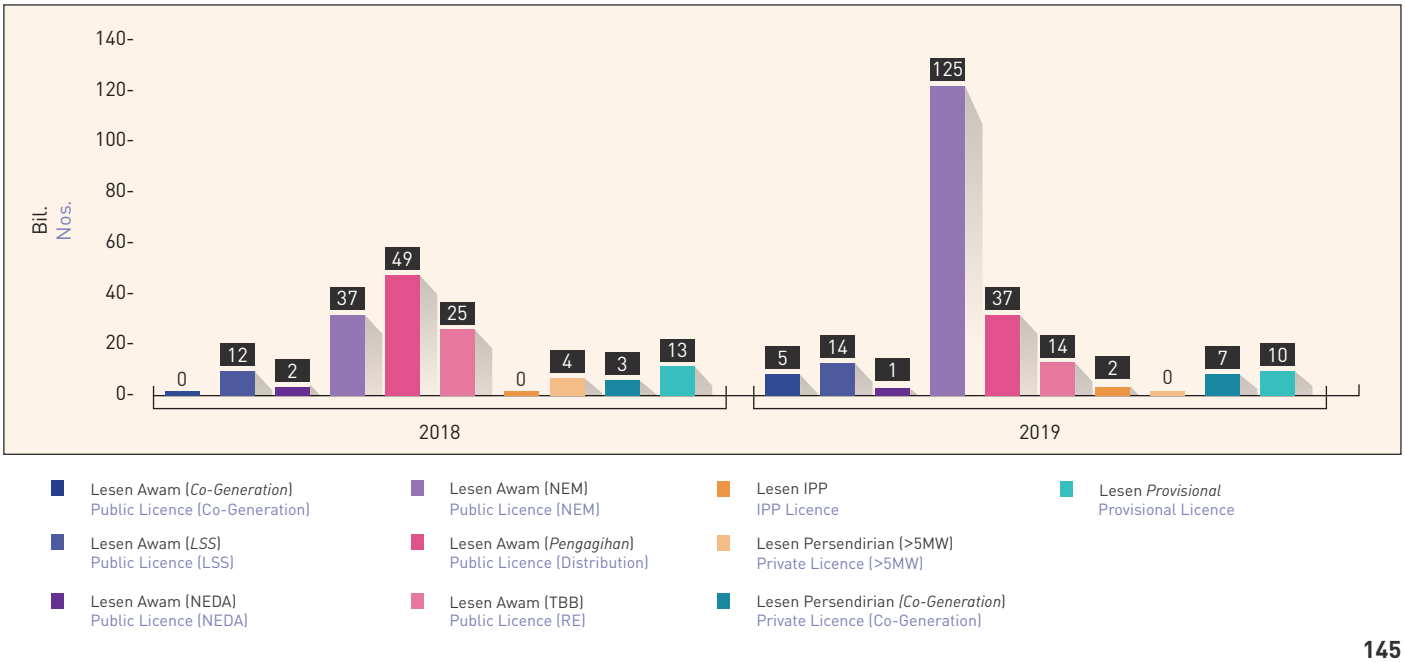
In addition, promotional activities undertaken by the Government attracted more parties to install solar PV to produce electricity for self-consumption and sales.

The decision to discontinue the Feed-in Tariff incentives for solar PVs resulted in the decline of registration of Renewable Energy (RE) licences to 14 licences in 2019 (2018: 25 licences). From 2019, Feed-in Tariff is to be limited to generation based on biogas, biomass, mini hydro and geothermal energy.

There were two Independent Power Producer (IPP) licences issued during the year – for Jimah East Power Sdn Bhd and Southern Power Generation Sdn Bhd. In 2018, no IPP licences were issued.

Distribution licences declined in 2019 to 37 licences (2018: 49 licences). This was attributed to the introduction of new criteria and more stringent processing of applications.

Pendaftaran Lesen Awam dan Persendirian bagi Pepasangan Elektrik yang Melebihi 5MW, 2018 dan 2019
Registration of Public and Private Licences for Electrical Installations Exceeding 5MW, 2018 and 2019



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Pendaftaran Lesen Peruncitan dan Lesen Gas Persendirian

Pada 2019, jumlah pendaftaran lesen peruncitan dan lesen gas persendirian meningkat sebanyak 50% kepada 2,793 lesen (2018: 1,859 lesen). Pendaftaran baharu meningkat sebanyak 99% kepada 2,526 lesen (2018: 1,270 lesen) sementara pembaharuan menurun sebanyak 55% kepada 267 lesen (2018: 589 lesen).

Terdapat peningkatan sebanyak 112% dalam lesen gas persendirian, kepada 2,089 lesen (2018: 984 lesen). Ini disebabkan oleh pelaksanaan sistem TPA yang telah meliberalisasikan pasaran runcit gas. Satu lagi faktor adalah kos gas yang rendah yang telah menarik kedai dobi, restoran dan institut pengajian, dengan sumbangan sebanyak 53.7% daripada pendaftaran pada 2019.

Peningkatan lesen peruncitan dan lesen gas persendirian disebabkan oleh kempen-kempen kesedaran yang telah dilaksanakan oleh ST dengan pemegang-pemegang lesen, serta pihak-pihak berkaitan yang lain seperti Badan-badan Pengurusan Bersama dan Perbadanan Pengurusan.

Registration of Retail and Private Gas Licences

In 2019, total registration of retail and private gas licences increased by 50% to 2,793 licences (2018: 1,859 licences). New registrations grew 99% to 2,526 licences (2018: 1,270 licences) while renewals declined by 55% to 267 licences (2018: 589 licences).

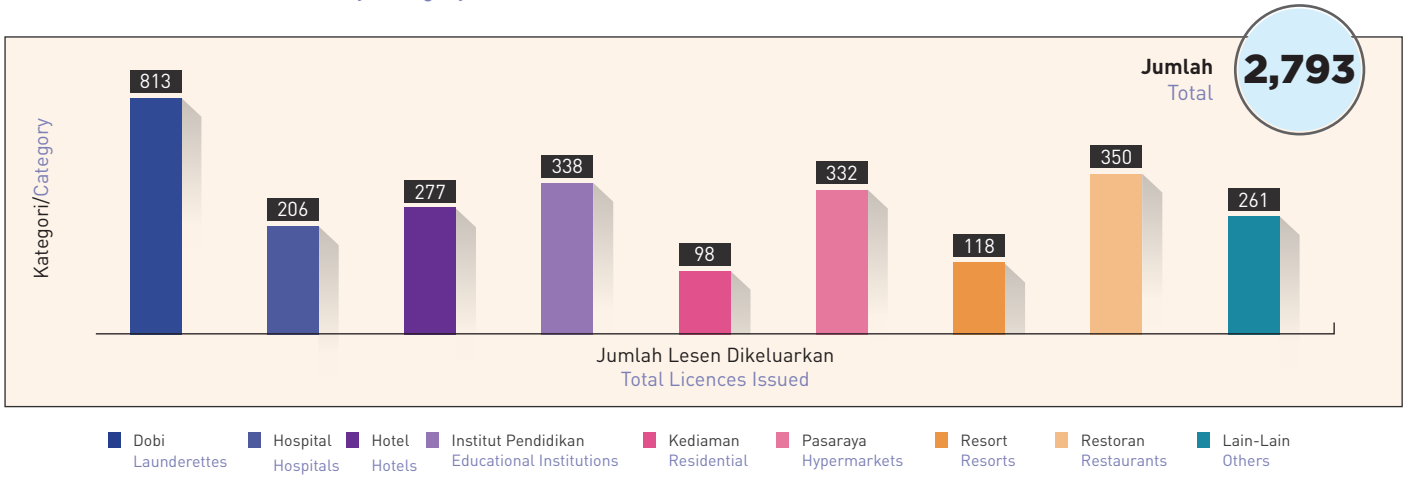
There was a 112% increase in private gas licences, to 2,089 licences (2018: 984 licences). This can be attributed to the implementation of the TPA system that has liberalised the retail gas market. Another factor is the competitive cost of gas that attracted launderettes, restaurants and educational institutions, who accounted for 53.7% of registrations in 2019.

The growth in retail and private gas licences can be attributed to awareness campaigns jointly undertaken by the Commission and licensees, as well as other related parties such as the Joint Management Bodies and Management Corporations.

Lesen Peruncitan dan Lesen Gas Persendirian yang Dikeluarkan, 2018 dan 2019
Retail and Private Gas Licences Issued, 2018 and 2019

Tahun Year		Jenis Lesen Type of Licence			
		Lesen Gas Persendirian Private Gas Licence	Lesen Peruncitan Retail Gas Licence	Jumlah Total	Jumlah Keseluruhan Overall Total
2018	Baharu New	984	286	1,270	**1,859**
	Pembaharuan Renewals	552	37	589	
2019	Baharu New	2,089	437	2,526	**2,793**
	Pembaharuan Renewals	187	80	267	

Lesen Peruncitan dan Lesen Gas Persendirian mengikut Kategori pada 2019
Retail and Private Gas Licences by Category in 2019



IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

PERAKUAN KEKOMPETENAN ELEKTRIK DAN GAS
ELECTRICAL AND GAS CERTIFICATES OF COMPETENCY

Untuk memastikan amalan-amalan yang selamat dalam pemasangan elektrik dan gas, ST mengeluarkan Perakuan Kekompetenan kepada individu-individu yang diberi kuasa untuk melaksanakan tugas-tugas ini.

Kategori Perakuan Kekompetenan Elektrik

i. Jurutera Perkhidmatan Elektrik
ii. Jurutera Elektrik Kompeten
iii. Penyelia Elektrik
iv. Penjaga Jentera
v. Pendawai
vi. Pencantum Kabel

Setakat akhir 2019, ST telah mengeluarkan sejumlah 145,465 Perakuan Kekompetenan Elektrik.

Pada 2019 sahaja, ST telah mengeluarkan sebanyak 5,955 Perakuan Kekompetenan Elektrik (2018: 7,588 perakuan). Daripada jumlah ini, sebanyak 91.46% (5,447 perakuan) daripada perakuan ini telah dikeluarkan melalui institusi bertauliah manakala baki sebanyak 8.54% (508 perakuan) dikeluarkan melalui peperiksaan kendalian ST.

To ensure safe practices in electrical and gas installations, the Commission issues Certificates of Competency to persons authorised to perform these tasks.

Categories of Electrical Certificates of Competency

i. Electrical Services Engineer
ii. Competent Electrical Engineer
iii. Electrical Supervisor
iv. Chargeman
v. Wireman
vi. Cable Jointer

As at end 2019, the Commission had issued a total of 145,465 Electrical Certificates of Competency.

In 2019 alone, it issued 5,955 Electrical Certificates of Competency (2018: 7,588 certificates). Of these, 91.46% (5,447 certificates) of the certificates were awarded through accredited institutions while the remaining 8.54% (508 certificates) came from examinations facilitated by the Commission.

Jumlah Perakuan Kekompetenan yang Dikeluarkan sehingga 2019
Total Competency Certificates Issued up to 2019

Pendawai
Wireman
81,376

Penjaga Jentera
Chargeman
60,381

Pencantum Kabel
Cable Jointer
855

Penyelia Elektrik
Electrical Supervisor
260

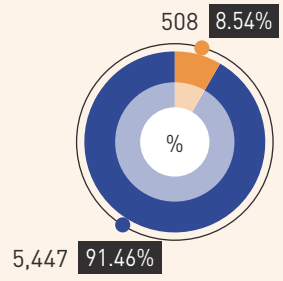
Jurutera Elektrik Kompeten
Competent Electrical Engineer
1,275

Jurutera Perkhidmatan Elektrik
Electrical Services Engineer
355

Penggantian Sijil
Certificate Replacement
963

Jumlah
Total
145,465

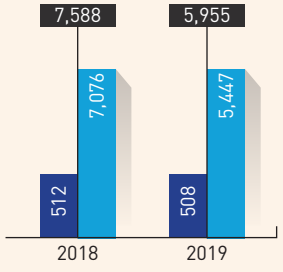
Perakuan Kekompetenan Elektrik yang Dikeluarkan pada 2019
Electrical Certificates of Competency Issued in 2019



Peperiksaan Kendalian ST
Examinations Facilitated by the Commisssion

Peperiksaan Kendalian Institusi Bertauliah
Examinations by ST-Accredited Institutions

Pengeluaran Perakuan Kekompetenan Elektrik, 2018 dan 2019
Electrical Certificates of Competency Issued, 2018 and 2019



Peperiksaan Kendalian ST
Examinations Facilitated by the Commission

Peperiksaan Kendalian Institusi Bertauliah
Examinations by ST-Accredited Institutions

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Peperiksaan Kekompetenan

Peperiksaan Kekompetenan dijalankan sepanjang tahun ini, dan terdiri daripada peperiksaan teori, amali dan lisan bagi Penjaga Jentera Elektrik. Manakala, Jurutera Elektrik Kompeten, Jurutera Perkhidmatan Elektrik dan Penyelia Elektrik perlu menduduki sesi temuduga.

Pada 2019, satu sesi peperiksaan teori telah dijalankan dalam bulan Julai 2019; seramai 386 calon (2018: 717 calon) telah menduduki peperiksaan Penjaga Jentera Elektrik Kategori A4, B0, B0 (TNB/SESB), B1 dan B4. Daripada bilangan ini, seramai 134 calon telah lulus peperiksaan-peperiksaan tersebut.

Hanya calon-calon yang telah lulus peperiksaan teori sahaja yang layak menduduki peperiksaan amali dan lisan; calon-calon yang telah gagal peperiksaan amali dan lisan sebelum ini dibenarkan mengambil semula peperiksaan tersebut.

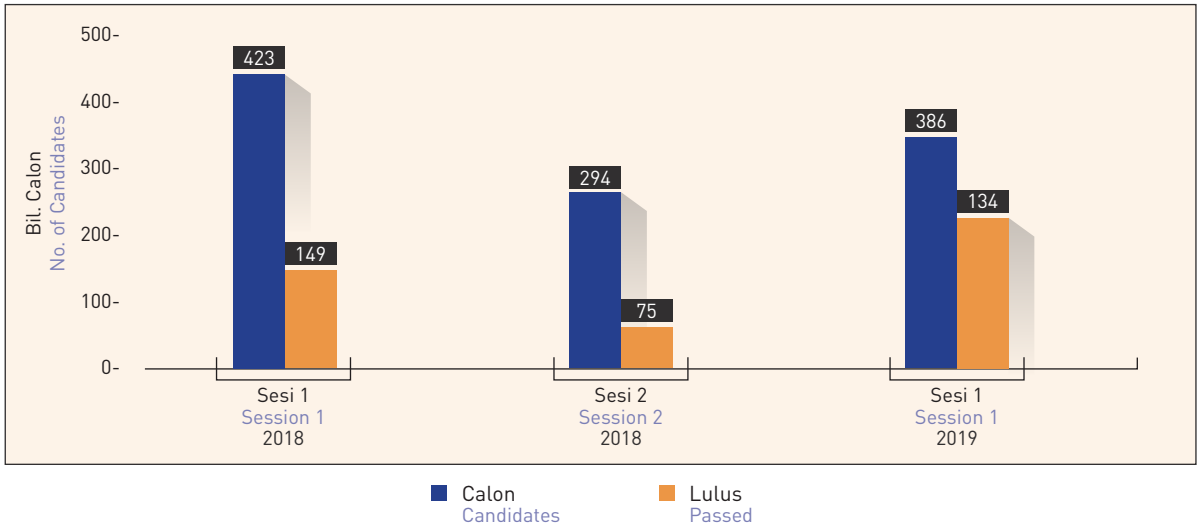
Competency Examinations

Competency Examinations are conducted throughout the year, and consist of theory, practical and oral examinations for Chargemen. Meanwhile, Competent Electrical Engineers, Electrical Service Engineers and Electrical Supervisors are required to sit for an interview.

In 2019, one theory examination was held in July 2019; it was for 386 candidates (2018: 717 candidates) who sat for Chargeman Category A4, B0, B0 (TNB / SESB), B1 and B4. Of this number, 134 candidates passed the examination.

Only those who passed their theory examination are eligible to sit for the practical and oral examinations; candidates who had previously failed their practical and oral examinations can also resit these examinations.

Peperiksaan Kekompetenan (Teori) untuk Penjaga Jentera, 2018 dan 2019
Competency Examination (Theory) for Chargemen, 2018 and 2019



Pengauditan Institusi Latihan Bertauliah

Sepanjang 2019, ST telah mengaudit 17 institusi latihan bertauliah yang menjalankan kursus-kursus kekompetenan elektrik di Semenanjung Malaysia, Sabah dan Sarawak.

Audit tersebut memastikan bahawa institusi-institusi latihan ini mematuhi semua syarat pentauliahan yang ditetapkan dari segi kelengkapan pengajaran dan pembelajaran, bilangan pelajar mengikut kuota yang diluluskan, dan kekompetenan tenaga pengajar. Institusi yang diaudit diberi nasihat mengenai cara-cara untuk meningkatkan mutu latihan secara berterusan agar dapat mewujudkan Orang Kompeten yang berkaliber tinggi.

Audit of Accredited Training Institutions

In 2019, the Commission audited 17 accredited training institutions that conduct electrical competency courses in Peninsular Malaysia, Sabah and Sarawak.

The audit ensures that training institutions comply with the accreditation criteria in terms of teaching and learning aids, number of students as per the approved quota, and competency of teaching staff. Audited institutions are advised on how to continuously enhance their quality of training in order to produce high calibre Competent Persons.

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Pendaftaran Kontraktor Gas

ST mewajibkan pendaftaran empat kelas Kontraktor Gas, iaitu Kelas A, Kelas B, Kelas C dan Kelas D. Setiap kelas mempunyai skop kerja masing-masing berdasarkan klasifikasi pepasangan gas, dan merangkumi sebarang kerja-kerja berkaitan dengan pemasangan, pembinaan, pengujian, operasi, penentukuran, penyenggaraan, pembaikan atau pengendalian talian paip atau pepasangan gas atau sebahagian daripadanya.

Sejak 2015, jumlah pendaftaran kontraktor gas kekal stabil, dengan jumlah pendaftaran tertinggi bagi Kelas A dan B. Pada 2019, jumlah pendaftaran menurun sebanyak 7% kepada 103 pendaftaran (2018: 111 pendaftaran). Daripada jumlah ini, 92 merupakan pembaharuan dan baki 11 merupakan permohonan baharu termasuk empat kontraktor yang bertukar kelas.

Perakuan Kekompetenan Gas

Orang Kompeten Gas memainkan peranan penting bagi memastikan talian gas berpaip dan pepasangan gas tidak membahayakan pengguna dan menjejas keselamatan orang awam. Kerja-kerja pemasangan, pembinaan, penyenggaraan, pembaikan atau pengendalian mana-mana talian paip, pepasangan atau bahagiannya hendaklah dijalankan atau diselia oleh Orang Kompeten.

Pada 2019, ST telah mengeluarkan sebanyak 42 Perakuan Kekompetenan Gas kepada lima kategori kelas, iaitu Jurutera Gas, Penyelia Kejuruteraan Gas, Jurugegas Gas Kelas I, II dan III.

Pada keseluruhannya, terdapat seramai 1,106 pemegang Perakuan Kekompetenan Gas bersama ST sehingga akhir 2019.

Registration of Gas Contractors

The Commission requires the registration of four classes of Gas Contractors, namely, Class A, Class B, Class C and Class D. Each class has its scope of work defined by the classification of gas installation, and it covers any work relating to the installation, construction, testing, operation, calibration, maintenance, repair or operation of pipelines or gas installations or any part thereof.

Since 2015, the registration of gas contractors has remained relatively stable, with the highest registrations belonging to Class A and B. In 2019, total registrations declined by 7% to 103 registrations (2018: 111 registrations). Of this number, 92 were for renewals and the remaining 11 were new applications that included four contractors who had changed classes.

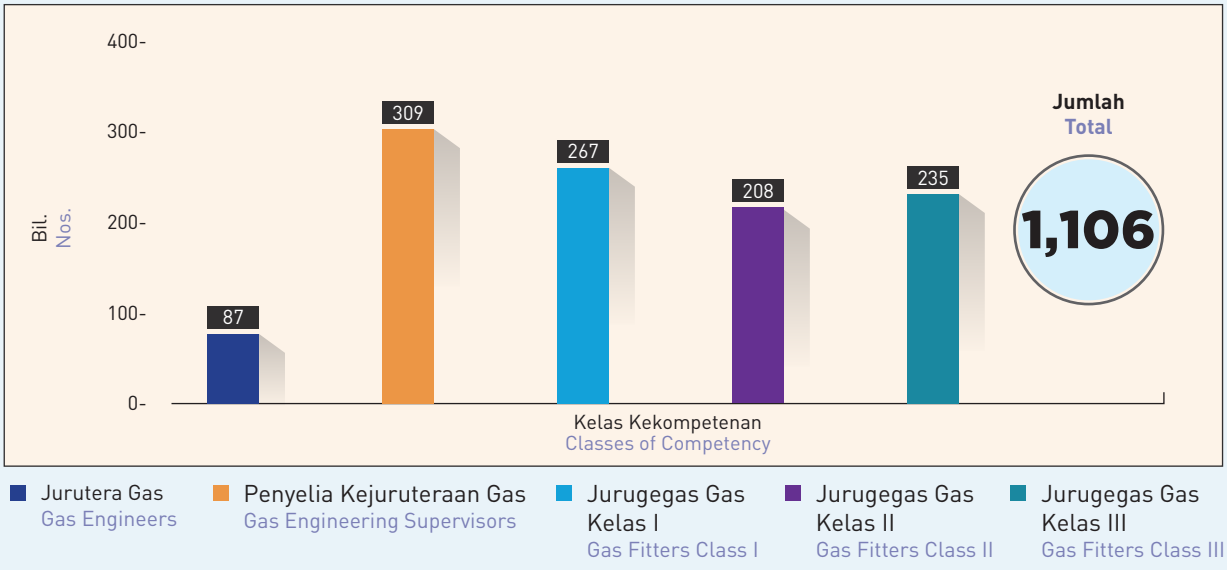
Gas Certificates of Competency

Gas Competent Persons play an important role in ensuring that gas pipelines and installations do not endanger users and public safety. The installation, construction, maintenance, repair or operation of any pipeline, installation or its part must be undertaken by a Competent Person or be supervised by one.

In 2019, the Commission issued 42 Gas Certificates of Competency to five classes, namely Gas Engineers, Gas Engineering Supervisors, Gas Fitters Classes I, II and III.

In total, there were 1,106 Gas Certificate of Competency holders with the Commission as at the end of 2019.

Orang Kompeten Gas Berdaftar sehingga 2019
Registered Gas Competent Persons as at 2019



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Pendaftaran Orang Kompeten Gas

Setiap Orang Kompeten Gas perlu berdaftar bersama ST dan tempoh sah pendaftaran adalah selama 12 bulan.

Pada 2019, terdapat seramai 408 pendaftaran Orang Kompeten Gas (2018: 484 pendaftaran). Daripada jumlah ini, seramai 385 adalah pembaharuan dan 23 pula adalah pendaftaran baharu. Sejak 2015, terdapat trend penurunan bagi pendaftaran Orang Kompeten Gas, kecuali untuk Jurugegas Gas Kelas II dan III.

Registration of Gas Competent Persons

Gas Competent Persons must be registered with the Commission and the registration is valid for 12 months.

In 2019, there were 408 Gas Competent Persons registrations (2018: 484 registrations). Of this number, 385 were for renewals and 23 were new registrations. Since 2015, there has been a downward trend in the registration of Gas Competent Persons, except for Gas Fitters Classes II and III.

Pendaftaran Orang Kompeten Gas, 2015-2019
Registration of Gas Competent Persons, 2015-2019

Kelas Kekompetenan Classes of Competency	Bil. Orang Kompeten Gas yang Berdaftar No. of Registered Gas Competent Persons									
	Pembaharuan Pendaftaran Renewal of Registration					Pendaftaran Baharu New Registrations				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Jurutera Gas Gas Engineers	28	24	26	26	24	0	0	2	0	1
Penyelia Kejuruteraan Gas Gas Engineering Supervisors	91	96	95	109	101	0	2	0	1	6
Jurugegas Gas Kelas I Gas Fitters Class I	112	125	135	143	137	1	1	1	0	7
Jurugegas Gas Kelas II Gas Fitters Class II	19	28	25	28	42	1	0	1	85	3
Jurugegas Gas Kelas III Gas Fitters Class III	53	53	63	88	81	6	0	1	4	6
Jumlah Total	**303**	**326**	**344**	**394**	**385**	**8**	**3**	**5**	**90**	**23**

Peperiksaan Kekompetenan Gas

Selaras dengan peruntukan Peraturan-Peraturan Bekalan Gas 1997, ST menjalankan peperiksaan-peperiksaan Kekompetenan Gas yang terdiri daripada peperiksaan bertulis dan peperiksaan lisan (temuduga).

Peperiksaan Bertulis

Peperiksaan bertulis adalah wajib diduduki oleh calon yang tidak mendapat pengecualian. Calon yang lulus peperiksaan bertulis perlu menghadiri temuduga sebelum diberi Perakuan Kekompetenan.

Pada 2019, peperiksaan bertulis tidak dilangsungkan disebabkan oleh kekurangan calon.

Peperiksaan Lisan (Temuduga)

Calon-calon yang layak untuk menghadiri temuduga mestilah samada telah lulus peperiksaan bertulis, telah diberi pengecualian, atau telah lulus kursus-kursus berkaitan talian paip gas di institusi-institusi latihan bertauliah.

Gas Competency Examinations

In accordance with the provisions of the Gas Supply Regulations 1997, the Commission conducts Gas Competency examinations that consist of a written examination and an oral examination (interview).

Written Examination

The written examination is compulsory for candidates who are not exempted. Candidates who pass their written examination are required to attend an interview prior to being issued the Certificate of Competency.

In 2019, there was no written examination because of the shortage of candidates.

Oral Examination (Interview)

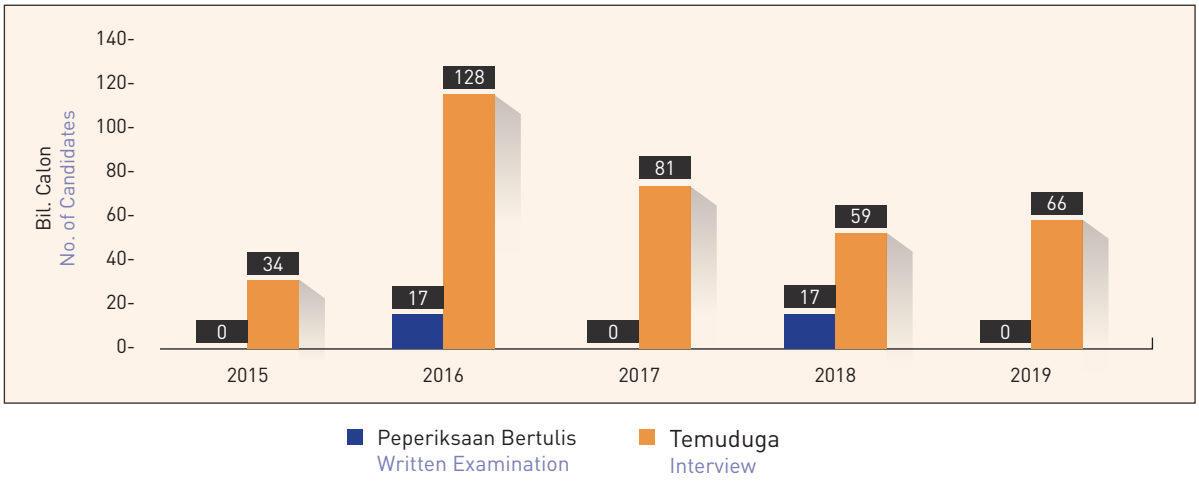
Candidates eligible for interviews must have either passed their written examination, be exempted from it, or have passed courses on gas pipelines at accredited training institutions.

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Pada 2019, ST telah menjalankan sebanyak 24 sesi temuduga yang telah dihadiri oleh 66 calon. Daripada bilangan ini, seramai 42 calon telah lulus peperiksaan lisan masing-masing dan telah diberi Perakuan Kekompetenan Gas. Mereka terdiri daripada seorang Jurutera Gas; lapan Penyelia Kejuruteraan Gas; tiga Jurugegas Gas Kelas I; enam Jurugegas Gas Kelas II dan 24 Jurugegas Gas Kelas III.

In 2019, the Commission conducted 24 interviews that were attended by 66 candidates. Of this number, 42 candidates passed their oral examination and were issued Gas Certificates of Competency. They consisted of one Gas Engineer; eight Gas Engineering Supervisors; three Gas Fitters Class I; six Gas Fitters Class II and 24 Gas Fitters Class III.

Calon Peperiksaan, 2015-2019
Examination Candidates, 2015-2019



PERAKUAN KELULUSAN
CERTIFICATES OF APPROVAL

ST mengeluarkan Perakuan Kelulusan kepada pengilang dan pengimport bagi memastikan kelengkapan elektrik yang dikawal selia adalah selamat untuk digunakan sebelum dijual.

Perakuan Kelulusan Kelengkapan Elektrik

Di bawah Peraturan 97(1), Peraturan-peraturan Elektrik 1994, Perakuan Kelulusan adalah mandatori bagi kelengkapan elektrik samada ianya dihasilkan di dalam negara, diimport, dipamerkan, dijual atau diiklankan di dalam negara ini.

Peruntukan ini adalah terpakai bagi jenis-jenis kelengkapan elektrik di bawah tanggungjawab ST, seperti berikut:

The Commission issues Certificates of Approval to manufacturers and importers to ensure that regulated electrical appliances are safe before they are sold.

Certificate of Approval for Electrical Appliances

Under Regulation 97(1) of the Electricity Regulations 1994, Certificates of Approval are mandatory for electrical appliances manufactured locally, imported, displayed, sold or advertised in the country.

This is applicable to the following types of electrical appliances that come under the ambit of the Commission:

1. Sebarang kelengkapan domestik

   Any domestic appliances

2. Sebarang kelengkapan voltan rendah yang biasanya dijual secara langsung kepada orang awam

   Any low voltage electrical appliances that is usually sold directly to the public

3. Sebarang kelengkapan voltan rendah yang tidak memerlukan kemahiran khusus untuk mengendalikannya

   Any low voltage electrical appliances that does not require specialised skills to operate

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Perakuan Kelulusan bertujuan untuk memastikan semua kelengkapan elektrik yang dikawal selia ST dijual mematuhi piawaian keselamatan Kerajaan untuk mengurangkan risiko kemalangan elektrik.

Setakat akhir 2019, ST telah mengawal selia 34 kategori kelengkapan elektrik yang memerlukan Perakuan Kelulusan. ST telah mengeluarkan 9,500 Perakuan Kelulusan baharu, dan kebanyakannya adalah bagi kelengkapan yang telah diimport iaitu sejumlah 8,176 atau 86%.

Pada masa yang sama, terdapat 5,644 pembaharuan, kebanyakannya bagi kelengkapan import iaitu sejumlah 4,382 atau 77%. Di samping itu, ST mengeluarkan sebanyak 2,845 Surat Pelepasan bagi kelengkapan import yang telah mendapat kelulusan Kastam Malaysia.

The Certificate of Approval aims to ensure that all ST-regulated electrical appliances sold comply with the Government's safety standards to reduce the risk of electrical accidents.

As at end 2019, the Commission had regulated 34 categories of electrical appliances that required Certificates of Approval. The Commission has issued 9,500 new Certificates of Approval, and the majority was for imported appliances, which amounted to 8,176 or 86%.

At the same time, there were 5,644 renewals, the majority of which was for imports which amounted to 4,382 or 77%. In addition, the Commission issued 2,845 Release Letters for imported appliances that had been cleared by the Malaysian Customs.

Perakuan Kelulusan dan Surat Pelepasan bagi Kelengkapan Elektrik, 2010-2019
Certificates of Approval and Release Letters for Electrical Appliances, 2010-2019

Tahun Year	Perakuan Kelulusan Certificates of Approval				Pembaharuan Renewal			Surat Pelepasan Release Letters
	Import Import	Kilang Factory	Pameran* Exhibition*	Jumlah Total	Import Import	Kilang Factory	Jumlah Total	
2010	507	145	2	654	216	111	327	152
2011	3,557	1,186	36	4,779	1,846	818	2,664	859
2012	3,597	1,069	17	4,683	1,988	1,053	3,041	1,297
2013	5,447	1,276	6	6,729	1,923	926	2,849	1,820
2014	7,539	1,927	29	9,495	1,739	806	2,545	1,990
2015	7,415	1,413	62	8,890	3,015	1,304	4,319	2,048
2016	8,085	1,306	31	9,422	3,124	1,192	4,316	2,425
2017	7,324	1,304	16	8,644	3,487	1,323	4,810	2,933
2018	8,941	1,398	8	10,347	3,461	1,217	4,678	3,315
2019	**8,176**	**1,316**	**8**	**9,500**	**4,382**	**1,262**	**5,644**	**2,845**

* Kelengkapan elektrik untuk pameran tidak boleh dijual kepada orang awam dan perlu dikembalikan semula ke negara asal setelah pameran tamat.
* Electrical appliances for exhibitions cannot be sold to the public and is to be returned to the country of origin after the exhibition has ended.

Terdapat 8,176 Perakuan Kelulusan bagi kelengkapan import pada 2019, yang menunjukkan penurunan sebanyak 8.6% (2018: 8,941 perakuan). Perakuan Kelulusan bagi produk yang dihasilkan di Malaysia turut menurun sebanyak 5.9% kepada 1,316 (2018: 1,398 perakuan).

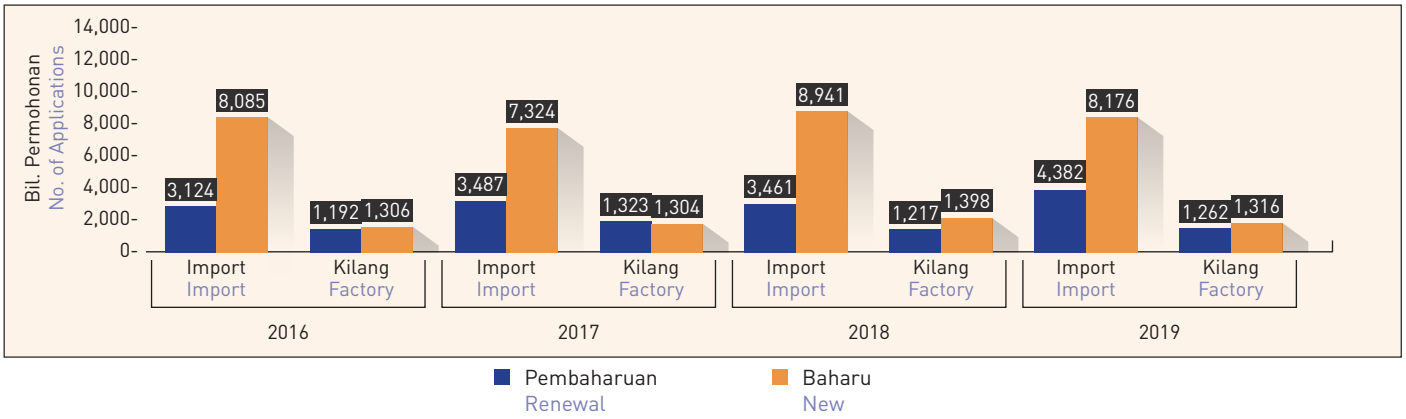
Dari segi pembaharuan perakuan, terdapat peningkatan sebanyak 26.6% bagi import iaitu kepada 4,382 (2018: 3,461 perakuan) dan peningkatan sebanyak 3.7% kepada 1,262 (2018: 1,217 perakuan) bagi kelengkapan elektrik yang dihasilkan dalam negara.

There were 8,176 Certificates of Approval for imported appliances in 2019, that shows a decline of 8.6% (2018: 8,941 certificates). Certificates of Approval for Malaysian manufactured products also declined by 5.9% to 1,316 (2018: 1,398 certificates).

In terms of renewal of certificates, there was a 26.6% increase for imports to 4,382 (2018: 3,461 certificates) and a 3.7% increase to 1,262 (2018: 1,217 certificates) for locally manufactured electrical appliances.

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Perakuan Kelulusan Mengimport dan Mengilang, 2016-2019
Certificates of Approval to Import and Manufacture, 2016-2019



Surat Pelepasan

ST mengeluarkan Surat Pelepasan bagi kelengkapan import yang telah mendapat kelulusan Kastam Malaysia. Terdapat dua kategori Surat Pelepasan:

- Bagi kelengkapan elektrik kawalan ST
- Bagi kelengkapan elektrik bukan kawalan ST untuk tujuan kegunaan komersial dan industri

Kelengkapan elektrik kawalan ST yang layak diberi Surat Pelepasan adalah kelengkapan untuk kegunaan khas, kajian kualiti, kajian kilang, eksport semula, untuk eksport komponen (100% eksport), komponen import (untuk penghasilan tempatan), dan kelengkapan transit. Surat Pelepasan yang dikeluarkan adalah tertakluk kepada pematuhan syarat-syarat yang telah ditetapkan oleh ST.

Dari tahun ke tahun, terdapat penurunan pengeluaran Surat Pelepasan, sebanyak 4% bagi kelengkapan kawalan dan 23% bagi kelengkapan bukan kawalan.

Perakuan Pendaftaran

Pengimport dan pengilang dikehendaki berdaftar bersama ST sebelum dikeluarkan Perakuan Kelulusan bagi kelengkapan elektrik masing-masing. Gambar rajah di bawah menunjukkan pendaftaran pada 2019. Kebanyakan pendaftar adalah pengimport dengan jumlah 570 perakuan atau 86% berbanding dengan pengilang tempatan yang berjumlah 95 perakuan atau 14%.

Release Letters

The Commission issues Release Letters for imported appliances that have been cleared by the Malaysian Customs. There are two categories of Release Letters:

- For ST-regulated electrical appliances
- For non-regulated electrical appliances intended for commercial and industrial use

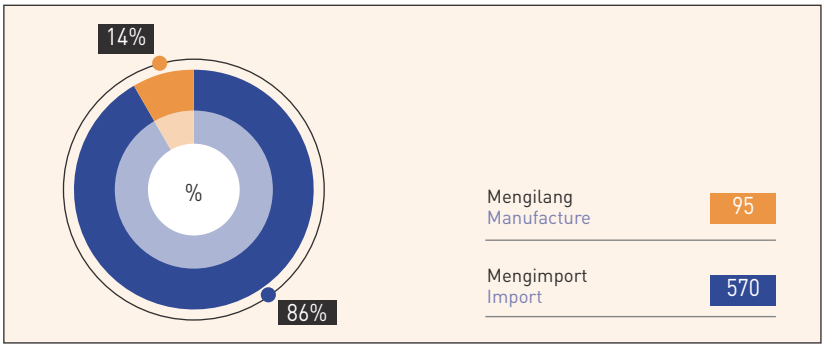
ST-regulated electrical appliances eligible for Release Letters are those intended for special use, quality studies, factory reviews, transhipment, component export (100% export), component importation (for local manufacturing) and transit appliances. Release Letters are issued subject to the fulfillment of conditions stipulated by the Commission.

Year on year, there was a decline in the Release Letters issued, by 4% for regulated appliances and 23% for non-regulated appliances.

Certificates of Registration

Importers and manufacturers are required to register with the Commission prior to the issuance of Certificates of Approval for their electrical appliances. The diagram below shows registrations in 2019. Importers accounted for most of the registrations at 570 certificates or 86% compared to local manufacturers comprising of 95 certificates or 14%.

Perakuan Pendaftaran untuk Mengilang dan Mengimport Kelengkapan Elektrik pada 2019
Certificates of Approval to Manufacture and Import Electrical Appliances in 2019



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Pembatalan Perakuan Kelulusan

ST akan membatalkan Perakuan Kelulusan bagi kelengkapan elektrik yang gagal Ujian Konsainmen SIRIM. Setakat bulan Disember 2019, ST telah membatalkan sebanyak 977 Perakuan Kelulusan milik 302 syarikat pengimport.

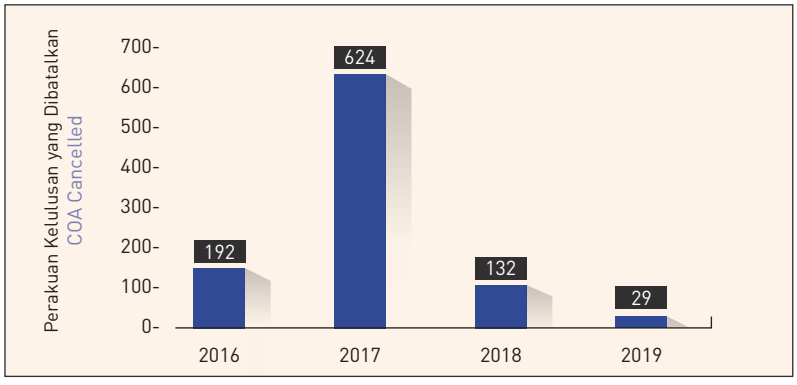
Pembatalan telah menurun sebanyak 78.85% pada 2018 berbanding 2017. Pada 2019 tiada pembatalan yang telah dilakukan kerana ST sedang dalam proses penambahbaikan pengurusan Pembatalan Perakuan. Namun, notis "tunjuk sebab" telah dikeluarkan kepada 22 buah syarikat pengimport yang melibatkan sebanyak 29 Perakuan Kelulusan yang telah gagal Ujian Konsainmen SIRIM pada 2019.

Cancellation of Certificates of Approval

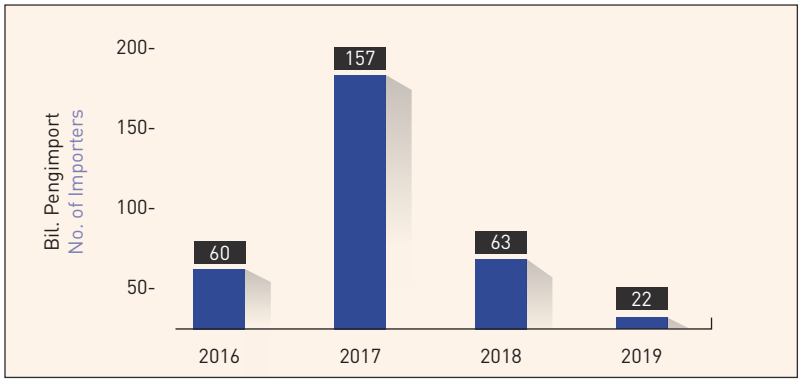
The Commission will cancel Certificates of Approval of electrical appliances that fail the SIRIM Consignment Test. As at December 2019, the Commission has cancelled a total of 977 Certificates of Approval belonging to 302 importers.

Cancellations declined by 78.85% in 2018 compared to 2017. In 2019, there were no cancellations because the Commission is in the process of upgrading the management of the Cancellation of Certificates. However, "show cause" notices were issued to 22 importers that involved 29 Certificates of Approval that failed the SIRIM Consignment Test in 2019.

Perakuan Kelulusan yang Dibatalkan, 2016-2019
Certificate of Approval Cancelled, 2016-2019



Jumlah Pengimport yang Terlibat, 2016-2019
Number of Importers Involved, 2016-2019



IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Memantau Pembatalan

ST memantau syarikat pengimport yang gagal Ujian Konsainmen SIRIM melalui pemeriksaan gudang-gudang mereka. Pada 2019, ST telah melawat 13 buah syarikat, suatu peningkatan sebanyak 44% berbanding tahun sebelumnya (2018: sembilan buah syarikat) bagi memastikan mereka:

- Menarik balik produk,
- Membaik pulih produk,
- Mengembalikan produk ke negara asal, atau
- Melupuskan produk.

ST akan membatalkan Perakuan Kelulusan kelengkapan elektrik bagi syarikat-syarikat yang gagal mengambil mana-mana tindakan yang tersebut.

Monitoring Cancellations

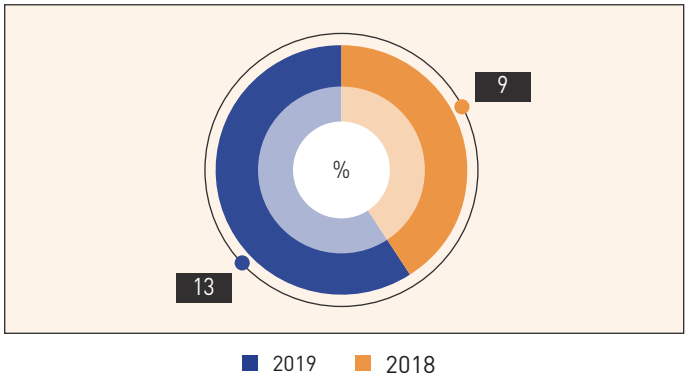
The Commission monitors importers who failed the SIRIM Consignment Test by inspecting their warehouses. In 2019, the Commission visited 13 companies, a 44% increase from the previous year (2018: nine companies) to ensure that they:

- Recall their products,
- Rectify their products,
- Return the products to the country of origin, or
- Dispose of the products.

The Commission will cancel Certificates of Approval for electrical appliances of companies that fail to take any of these actions.

Pelupusan 12 unit *Robotic Vacuum Cleaner* bernilai RM10,000 di Sungai Buloh, Selangor pada 2 April 2019.
The disposal of 12 Robotic Vacuum Cleaners worth RM10,000 in Sungai Buloh, Selangor on 2 April 2019.

Pemeriksaan Gudang Pengimport yang Gagal Ujian Konsainmen SIRIM
Inspection of Warehouses of Importers who Failed the SIRIM Consigment Test



MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

***Stakeholder Engagement* bersama SIRIM QAS**

Bagi tempoh 2018 dan 2019, ST telah bekerjasama dengan pihak SIRIM QAS International Sdn Bhd untuk memantau pasaraya yang wajib memiliki Perakuan Kelulusan untuk menjual kelengkapan elektrik.

Ini melibatkan sesi lawatan di mana pemegang taruh telah diberikan taklimat oleh ST mengenai peraturan-peraturan keselamatan kelengkapan elektrik, prosedur permohonan Perakuan Kelulusan, prosedur Ujian Konsainmen dan proses pelabelan SIRIM, kecekapan tenaga, pelupusan kelengkapan elektrik yang gagal ujian konsainmen dan penalti yang dikenakan bagi kesalahan.

Lawatan-lawatan tersebut juga melibatkan lawatan tapak bagi memastikan kelengkapan elektrik yang dipamerkan dan dijual mempunyai label SIRIM-ST dan cekap tenaga.

Stakeholder Engagement with SIRIM QAS

In 2018 and 2019, the Commission partnered with SIRIM QAS International Sdn Bhd to monitor hypermarkets required to have Certificates of Approval to sell electrical appliances.

This involved visits where stakeholders were briefed by the Commission on electrical appliances safety regulations, Certificate of Approval application procedures, SIRIM consignment testing and labeling procedures, energy efficiency, disposal of appliances that fail the consignment test and the penalties for offences committed.

The visits included a site tour to ensure electrical appliances on display and sold have the SIRIM-ST and energy efficiency labels.

Pasaraya
Hypermarket

- Mydin Stores Sdn Bhd
- Giant, GCH Retail (Malaysia) Sdn Bhd
- Aeon Co. (Malaysia) Bhd
- Tesco (Stores) Malaysia Sdn Bhd
- Ikano Handel Sdn Bhd-IKEA
- Sen Heng Sdn Bhd
- Super CowBoy Sdn Bhd, Melaka
- Eco- Shop Marketing Sdn Bhd, Segamat
- PrestoMall (11 street)

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Kelulusan untuk Memasang (ATI) dan Kelulusan untuk Mengendali (ATO) Pepasangan Gas

Menurut Peraturan 15 dan 16, Peraturan-peraturan Bekalan Gas 1997, ianya adalah mandatori bagi kesemua sistem gas berpaip untuk diperakui dengan Kelulusan Untuk Memasang (ATI) dan Kelulusan untuk Mengendali (ATO) oleh ST.

Sejak 2011, terdapat peningkatan dalam pengeluaran ATI dan ATO yang selaras dengan peningkatan permintaan gas sebagai tenaga pilihan dalam sektor industri dan komersial. Pada 2019, terdapat peningkatan mendadak dalam permohonan ATI sebanyak 46.8% kepada 2,386 permohonan; terdapat juga peningkatan sejajar bagi ATO sebanyak 50.7% kepada 2,135 permohonan. Kebanyakan permohonan baharu adalah dari kedai dobi, dengan jumlah sebanyak 917 permohonan ATI (2018: 360 permohonan) dan sebanyak 815 permohonan ATO (2018: 204 permohonan).

Peningkatan mendadak tersebut adalah antara kesan daripada seminar-seminar kesedaran yang dikendalikan oleh ST. Seminar-seminar tersebut menekankan bahawa premis-premis yang mempunyai sistem perpaipan gas perlu mendapatkan ATI dan ATO dari ST. Penyiasatan kemalangan gas di kedai-kedai dobi pada 2018 telah menunjukkan bahawa sistem gas berpaip yang tidak diluluskan telah dipasang oleh pihak-pihak yang tidak bertauliah. Daripada hasil penyiasatan tersebut, ST telah bekerjasama dengan pihak-pihak berkuasa tempatan untuk memastikan bahawa kedai-kedai dobi memaparkan ATI dan ATO sebelum memulakan operasi perniagaan.

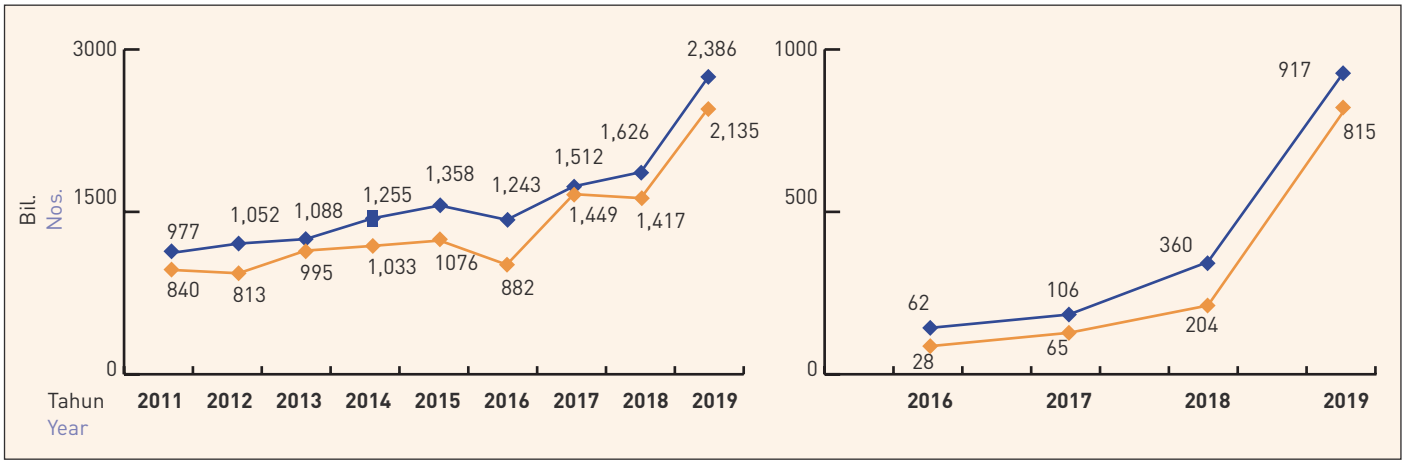
Approval to Install (ATI) and Approval to Operate (ATO) for Gas Installations

In accordance with Regulation 15 and 16 of the Gas Supply Regulations 1997, it is mandatory for all gas piping systems to be certified through the issuance of the Approval to Install (ATI) and Approval to Operate (ATO) by the Commission.

Since 2011, there has been an uptrend in the issuance of ATI and ATO with the growing demand for gas as the preferred energy choice in the industrial and commercial sectors. In 2019, there was a sudden increase in ATI applications that grew by 46.8% to 2,386 applications; there was also a corresponding increase in ATO that grew by 50.7% to 2,135 applications. The majority of new applications were from launderettes, with 917 ATI applications (2018: 360 applications) and 815 ATO applications (2018: 204 applications).

The sudden increase can be attributed to awareness seminars organised by the Commission. The seminars highlighted that premises with gas piping systems must obtain the ATI and ATO from the Commission. Investigations of gas accidents at launderettes in 2018 showed that illegal piping systems have been installed by unauthorised personnel. As a result, the Commission has been collaborating with local authorities to ensure that launderettes publicly display their ATI and ATO prior to commercial operations.

Bilangan ATI dan ATO yang Dikeluarkan, 2011-2019
Number of ATI and ATO Issued, 2011-2019



Bilangan ATI dan ATO yang Dikeluarkan bagi Premis Dobi, 2016-2019
Number of ATI and ATO Issued for Launderettes, 2016-2019

Kelulusan untuk Memasang (ATI)
Approval to Install (ATI)

Kelulusan untuk Mengendali (ATO)
Approval to Operate (ATO)

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Perakuan Kelulusan bagi Peralatan Gas

Terdapat dua kategori Perakuan Kelulusan bagi gas. Kategori pertama adalah untuk pengilang, pemasang, atau pengimport dan juga untuk gegasan, perkakas dan peralatan gas. Perakuan-perakuan ini dikeluarkan oleh ST menurut Peraturan 116 dan Peraturan 117, Peraturan Bekalan Gas 1997. Perakuan Kelulusan diperlukan sebelum penjualan sebarang produk gas atau sebahagian daripadanya.

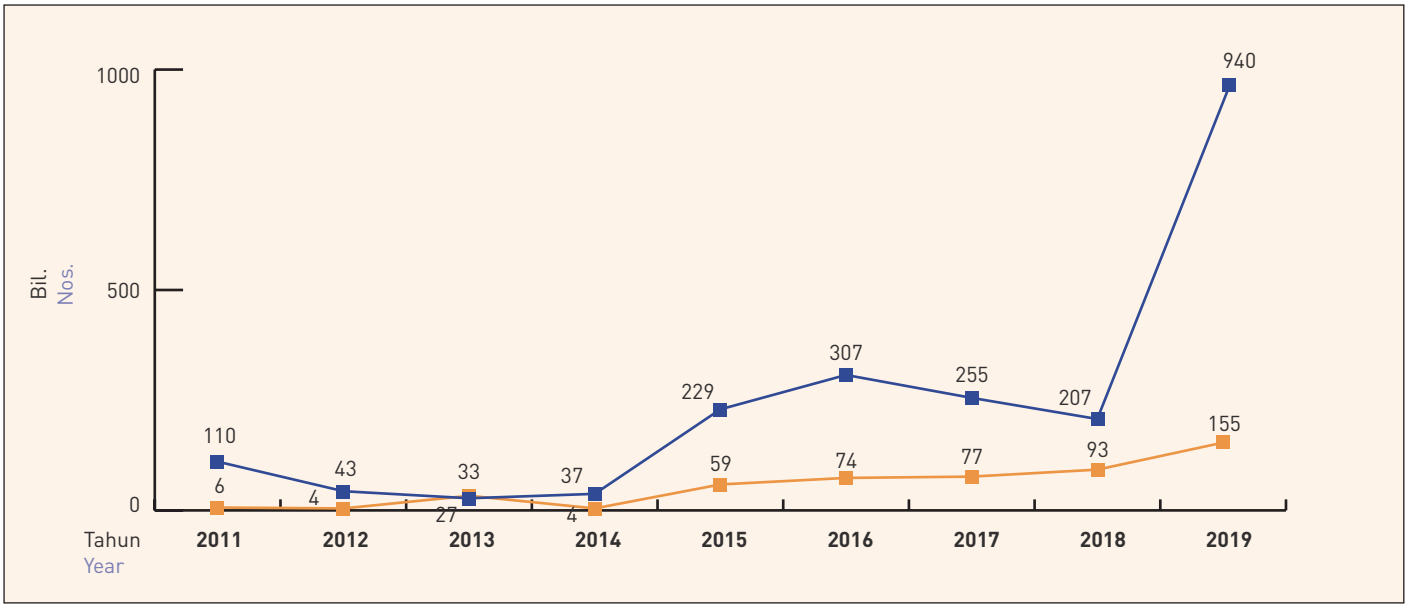
Sejak 2011, permohonan daripada pengilang, pemasang, dan pengimport terus meningkat. Pada 2019, terdapat peningkatan ketara iaitu sebanyak 940 permohonan bagi gegasan, perkakas, atau peralatan gas (2018: 207 permohonan).

Certificates of Approval for Gas Equipment

There are two categories of Certificates of Approval for gas. One is for manufacturers, assemblers or importers and the other is for gas fittings, appliances, or equipment. They are issued by the Commission in accordance with Regulation 116 and Regulation 117 of the Gas Supply Regulations 1997. Certificates of Approval are required prior to the sale of any gas product or part thereof.

Since 2011, there has been a steady increase in applications from manufacturers, assemblers, and importers. In 2019, there was a sharp increase in applications for gas fittings, appliances, or equipment, which increased to 940 applications (2018: 207 applications).

Bilangan Perakuan Kelulusan yang Dikeluarkan, 2011-2019
Number of Certificates of Approval Issued, 2011-2019



Pelan dan Program Pengurusan Keselamatan Gas Berpaip (GSMPP)

Di bawah GSMPP, ST telah menjalankan taklimat keselamatan gas berpaip di seluruh Semenanjung Malaysia. Tujuan taklimat-taklimat tersebut adalah untuk memaklumkan pemilik pepasangan gas mengenai kepentingan perancangan dan penyenggaraan yang betul bagi pepasangan gas di premis mereka. GSMPP menggalakkan pengawalseliaan sendiri, supaya pemilik pepasangan mematuhi peraturan-peraturan dan mengamalkan langkah-langkah bagi memastikan keselamatan sistem gas berpaip di premis masing-masing.

Piped Gas Safety Management Plan and Programme (GSMPP)

Under the GSMPP, the Commission conducted piped gas safety briefing programmes throughout Peninsular Malaysia. The briefings aimed to educate gas installation owners on the importance of proper planning and maintenance of gas installations at their premises. The GSMPP promotes self-regulation, to encourage installation owners to comply with regulations and adopt practices to ensure the safety of gas piping systems at their respective premises.

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Program GSMPP bagi 2019

Premis yang telah dilawati ST bagi Pelan dan Program Pengurusan Keselamatan Gas Berpaip:

GSMPP Programme in 2019

Premises visited by the Commission for the Piped Gas Safety Management Plan and Programme:

Kedah	Perak	Kuala Lumpur	Selangor	Negeri Sembilan
• Grand Alora, Kedah	• AEON Section 18 • AEON Kinta City • AEON Klebang • AEON Big, Falim	• One Menerung	• Sunway Pyramid (Gas + Elektrik) (Gas + Electrical)	• AEON Mall Seremban 2 • AEON Mall Nilai

MENINGKATKAN KUALITI PELAKSANAAN PERKHIDMATAN
IMPROVING THE QUALITY OF SERVICE DELIVERY

ST menggunakan beberapa kaedah yang lengkap untuk meningkatkan kualiti pelaksanaan perkhidmatannya. Antaranya termasuklah Indeks Kepuasan Pelanggan dan ISO 9001:2015.

Penggunaan amalan terbaik antarabangsa akan turut mengukuhkan lagi kedudukan ST, perhubungan dengan pelanggan dan juga menyumbang kepada pencapaian visi ST untuk menjadi badan kawal selia tenaga bertaraf dunia yang efektif dan berwibawa.

Indeks Kepuasan Pelanggan ST

Indeks Kepuasan Pelanggan (CSI) adalah alat penilaian prestasi yang telah diiktiraf sejagat untuk mengukur tingkah laku pelanggan sebelum dan selepas berurusan dengan sesebuah organisasi. Ia menggunakan tinjauan-tinjauan yang ringkas dan efektif untuk menilai kecemerlangan perkhidmatan berdasarkan penggunaan pelbagai kriteria.

Pada 2019, ST telah memperolehi markah CSI sebanyak 86.8% berbanding dengan 79.7% pada 2018. Markah tersebut diperolehi adalah berdasarkan tinjauan di kalangan seramai 210 orang responden bagi kajian CSI yang telah dijalankan sepanjang bulan Oktober dan November 2019.

The Commission uses several tools to improve the quality of service delivery. Among them are the Customer Satisfaction Index and the ISO 9001:2015.

These international best practices will further strengthen the Commission's standing, customer relationships and contribute towards the realisation of its vision to be a world class energy regulator that is effective and authoritative.

ST Customer Satisfaction Index

The Customer Satisfaction Index (CSI) is a universally recognised performance appraisal tool used to measure the behaviour of customers before and after their interactions with an organisation. It utilises simple and effective surveys to quantify service excellence by using various criteria.

In 2019, the Commission had a CSI score of 86.8%, compared to 79.7% in 2018. The score was based on a sample of 210 respondents to the CSI survey that was conducted in October and November 2019.

Indeks Kepuasan Pelanggan ST
ST Customer Satisfaction Index (CSI)

Kriteria Criteria	
Perkhidmatan Pelanggan Customer Service	
Kemudahan Berurusan Ease of Doing Business	
Layanan Reception	
Masa diambil Time Taken	
Tindakan susulan Follow up	
Indeks Kepuasan Pelanggan Customer Satisfaction Index	86.8%

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Audit terhadap Pematuhan kepada Syarat-syarat ISO 9001:2015

Pada bulan Februari 2019, ST telah menerima pensijilan Sistem Pengurusan Kualiti ISO 9001: 2015 berasaskan Audit Pengawasan Pertama, yang sah mulai Februari 2018 hingga 2021.

Organisasi-organisasi menggunakan piawaian ini untuk menunjukkan keupayaan masing-masing dalam pelaksanaan perkhidmatan berkesan yang memenuhi kehendak pelanggan dan peraturan kawal selia dengan konsisten. Ia merupakan standard yang paling popular dalam siri ISO 9000 dan satu-satunya standard dalam siri ini yang diperakui.

Bagi mengekalkan pensijilan Sistem Pengurusan Kualiti ISO 9001:2015 ini, satu audit kualiti dalaman telah dijalankan sepanjang Julai sehingga Oktober 2019 sebagai persediaan bagi Audit Pemantauan Kedua, yang telah dijadualkan untuk 2020.

Audit to Comply with ISO 9001:2015 Requirements

In February 2019, the Commission received its ISO 9001: 2015 Quality Management System certification based on the First Surveillance Audit. The Certification is valid from February 2018 to 2021.

Organisations use the standard to demonstrate their ability to consistently provide services that meet customer and regulatory requirements. It is the most popular standard in the ISO 9000 series and the only standard in the series to be certified.

To maintain the certification of the ISO 9001: 2015 Quality Management System, an internal quality audit was conducted from July to October 2019 in preparation for the Second Surveillance Audit, scheduled for 2020.

Pensijilan ISO 9001:2015 pada 2019-2021 merangkumi Skop Kerja seperti berikut:
The Commission's ISO 9001:2015 for 2019-2021 covers the following Scope of Work:

1. Pengurusan Pelesenan Pepasangan Persendirian Bagi Kapasiti Bawah 5MW
   Management of Private Installation Licensing for Capacity Under 5MW
2. Pengurusan Pelesenan Pepasangan Persendirian (Bagi Kapasiti 5MW dan Ke Atas) dan Pepasangan Awam
   Management of Private Installation Licensing (For Capacity 5MW and Up) and Public Installation
3. Pengurusan Perakuan Kekompetenan Elektrik
   Electrical Competency Certificate Management
4. Pengurusan Kelulusan Pendaftaran Orang Kompeten Elektrik
   Electrical Competency Person Registration Approval Management
5. Pentauliahan Institusi Latihan
   Accreditation of Training Institutions
6. Pengurusan Kelulusan Kelengkapan Elektrik
   Electrical Equipment Approval Management
7. Pengurusan Perakuan Pendaftaran Pepasangan
   Management of Installation Registration Certificate
8. Pengurusan Perakuan Pendaftaran Kontraktor Elektrik
   Management of Electrical Contractor Registration Certificate
9. Pengurusan Perakuan Pendaftaran Pengurus Tenaga Elektrik
   Management of Electricity Manager Registration Certificate
10. Pengurusan Pelesenan Gas
    Gas Licensing Management
11. Pengurusan Perakuan Kekompetenan Gas
    Gas Competency Certification Management
12. Pengurusan Pendaftaran Orang Kompeten Gas
    Gas Competent Persons Registration Management
13. Pengurusan Peralatan Gas
    Gas Equipment Management
14. Pengurusan Kelulusan Untuk Memasang Dan Mengendali Talian Paip/ Pepasangan Gas
    Management Approval To Install And Operate Gas Pipelines / Installations
15. Pengurusan Perakuan Pendaftaran Kontraktor Gas
    Management of Gas Contractor Registration Certificate

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

16 Penguatkuasaan, Penyiasatan Dan Pendakwaan
Enforcement, Investigation And Prosecution

17 Pengurusan Kemalangan
Accident Management

18 Pengurusan Kawalan Dokumen
Document Control Management

19 Pengurusan Latihan
Training Management

20 Pengurusan Kawalan Rekod
Records Control Management

21 Pengurusan ST Knowledge Centre
ST Knowledge Centre Management

22 Pengurusan Perolehan
Procurement Management

23 Pengurusan Penyelenggaraan Bangunan Ibu Pejabat ST dan Pejabat Kawasan
Maintenance Management of ST Headquarters Building and Regional Offices

24 Pengurusan Laman Web Suruhanjaya Tenaga
Energy Commission Website Management

25 Penentukuran
Calibration

26 Pengurusan Audit Kualiti Dalaman
Internal Quality Audit Management

27 Kajian Semula Pengurusan
Management Review

28 Maklumbalas Pelanggan
Customer Feedback

29 Kawalan Ketakakuran, Tindakan Pembetulan Dan Penambahbaikan
Non-Compliance Control, Corrective Action And Improvement

Pengurusan Risiko

ST memberi penekanan pada pengurusan risiko yang berkesan bagi memastikan pertumbuhan yang mampan serta meningkatkan reputasinya sebagai badan kawal selia. Pada bulan Ogos 2018, ST telah memperkukuhkan fungsi pengurusan risikonya dengan penubuhan Bahagian Pengurusan Risiko Peraturan untuk melaksanakan inisiatif-inisiatif baharu.

Aktiviti utama pada 2019 adalah pelaksanaan kajian pengurusan risiko ST berdasarkan standard ISO 31000: 2018. Bagi tujuan ini, suatu model analitis dan sistematik telah dibangunkan untuk pengenalpastian risiko dan menentukan tindakan wajar yang perlu diambil untuk mengawal dan mengurangkan risiko-risiko yang telah dikenalpasti. Pengurusan risiko di ST merangkumi proses penetapan konteks, pentaksiran risiko, pengurusan risiko, komunikasi dan perundingan, serta pemantauan dan kajian semula.

Risk Management

The Commission places emphasis on effective risk management to ensure sustainable growth and to enhance its reputation as a regulatory body. In August 2018, the Commission strengthened its risk management functions by creating the Regulatory Risk Management Division to embark on new initiatives.

The key activities in 2019 were the implementation of the Commission's risk management study in accordance with the ISO 31000: 2018 standards. For this purpose, an analytical and systematic model was developed to identify risks and determine the appropriate actions to be taken to control and mitigate the identified risks. Risk management at the Commission covers the process of setting context, risk analysis, risk management, communication and consultation, as well as monitoring and review.

MENAMBAHBAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

Rangka Kerja Pengurusan Risiko

Pada 2019, Rangka Kerja Pengurusan Risiko ST telah diwujudkan untuk memberikan pendekatan yang komprehensif dan proaktif dalam pengurusan risiko. Rangka kerja ini merangkumi semua aktiviti, proses, perkhidmatan, aset dan sistem dalam organisasi. Ini akan membentuk budaya asas pengurusan risiko yang melindungi aset, operasi dan pemegang taruh ST.

Analisis Impak Peraturan (RIA)

Analisis Impak Peraturan (RIA) adalah satu kajian untuk mengenal pasti dan menilai impak penguatkuasaan undang-undang. Ia menggunakan beberapa kaedah seperti analisis kos-manfaat untuk mengenal pasti kos-kos yang terlibat dalam pelaksanaaan perundangan baharu. Kajian ini turut merangkumi penglibatan pemegang taruh dan masyarakat untuk mendapatkan input dan maklum balas terhadap perundangan baharu. Pelaksanaan RIA adalah bagi memastikan bahawa perundangan tersebut dilaksanakan untuk memberi manfaat yang berimpak dan efektif bagi pemegang taruh serta memastikan ketelusan, kesaksamaan dan kebertanggungjawaban.

Pelaksanaan RIA adalah selaras dengan Amalan Peraturan Baik ST dan mematuhi Dasar Pembangunan dan Pelaksanaan Peraturan Negara yang dikeluarkan oleh Perbadanan Produktiviti Malaysia (MPC).

Pada 2019, RIA telah dilaksanakan bagi penggubalan cadangan Akta Kecekapan Tenaga dan Konservasi. ST telah mengadakan perundingan awam secara dalam talian di *Portal UPC* yang telah bermula dari Ogos sehingga September 2019. Portal tersebut berfungsi sebagai platform untuk mengumpul maklum balas daripada pemegang taruh terhadap penggubalan Akta tersebut.

Hasilnya, sebanyak 93% daripada pemegang taruh seperti *Federation of Malaysian Manufacturers* (FMM), *The Electrical and Electronics Association of Malaysia* (TEEAM), *Malaysia Association of Registered Electrical Engineers* (MAREEM) telah bersetuju supaya Malaysia melaksanakan pelbagai inisiatif kecekapan tenaga di samping mengambil langkah untuk mengurangkan kebergantungan terhadap bahan api fosil. Mereka juga bersetuju dengan penubuhan sebuah organisasi untuk penguatkuasaan akta baharu tersebut.

RIA juga telah mengadakan suatu sesi taklimat pada September 2019 untuk tiga pemegang taruh utama. Mereka terdiri daripada sektor pendidikan yang diwakili oleh Universiti Teknologi MARA dan Universiti Pertanian Malaysia; pihak persatuan-persatuan yang diwakili oleh FMM; dan sektor korporat yang diwakili oleh Gas Malaysia Berhad.

Satu taklimat yang serupa turut diadakan untuk Ahli-ahli Kabinet, Dewan Negara dan Dewan Rakyat. Kesemua pandangan yang telah diterima di sepanjang proses RIA tersebut telah direkodkan untuk membantu dalam penyediaan Pernyataan Impak Regulatori yang akan dikemukakan kepada MPC untuk kelulusan.

Risk Management Framework

In 2019, the Commission's Risk Management Framework was developed to provide a comprehensive and proactive approach to risk management. The framework covers all activities, processes, services, assets and systems in the organisation. This will establish the foundation for a risk management culture that protects the assets, operations and stakeholders of the Commission.

Regulatory Impact Analysis (RIA)

The Regulatory Impact Analysis (RIA) is a study to identify and evaluate the impact of a law that is to be enforced. It uses a number of methods such as cost-benefit analysis to identify the costs involved in implementing the new legislation. It also includes the involvement of stakeholders and the public to obtain input and feedback on the new legislation. The implementation of the RIA is to ensure that the legislation will be implemented to provide benefits that are impactful and effective for stakeholders as well as ensuring transparency, equality, and accountability.

The implementation of the RIA is aligned to the Commission's Good Regulatory Practices and is in compliance with the National Policy on Development and Implementation of Regulations issued by the Malaysia Productivity Corporation (MPC).

In 2019, an RIA was conducted for the drafting of the proposed Energy Efficiency and Conservation Act. The Commission held an online public consultation via the UPC Portal from August to September 2019. The portal served as the platform to gather stakeholders' feedback on the proposed Act.

As a result, 93% of key stakeholders such as the Federation of Malaysian Manufacturers (FMM), The Electrical and Electronics Association of Malaysia (TEEAM), Malaysia Association of Registered Electrical Engineers (MAREEM) agreed that Malaysia should implement various energy efficiency initiatives, in addition to taking steps to reduce dependence on fossil fuels. They also agreed to the establishment of an organisation for the enforcement of the new legislation.

RIA also held a briefing session in September 2019 for three key stakeholders. They were from the education sector that was represented by Universiti Teknologi MARA and Universiti Pertanian Malaysia; associations who were represented by FMM; and the corporate sector that was represented by Gas Malaysia Berhad.

A similar briefing was also held for the Cabinet, Members of Parliament and the Senate. All views received during the RIA engagements were recorded to assist in the preparation of the Regulatory Impact Statement that will be submitted to the MPC for approval.

IMPROVING REGULATORY QUALITY AND SERVICE DELIVERY

Laman Mikro Aduan Pengguna ST

Pada Julai 2019, ST telah menubuhkan laman mikro bagi Pengurusan Aduan Pengguna ST. Sistem e-aduan ini memberi panduan kepada pengguna mengenai cara membuat aduan yang berkaitan dengan isu-isu pembekalan tenaga elektrik dan gas berpaip. Di reka bentuk sebagai suatu platform mesra pengguna, laman mikro aduan ini mencerminkan trend terkini dalam pengurusan aduan.

Laman mikro Aduan Pengguna ST ini boleh dicapai melalui pautan: https://www.st.gov.my/microsites/index/4.

ST Consumer Complaints Microsite

In July 2019, the Commission set up the ST Consumer Complaints microsite. This e-complaint system guides consumers on how to file complaints on issues related to the supply of electricity and piped gas. Designed to be a user-friendly platform, the complaints microsite reflects the latest trend in complaints management.

The ST Consumer Complaints microsite can be accessed via the link: https://www.st.gov.my/microsites/index/4.

Penerbitan

Di samping laporan terkini mengenai pembangunan di ST, berita dan trend dalam industri tenaga tempatan, serantau, dan global turut disalurkan oleh ST melalui pelbagai penerbitan.

Terbitan-terbitan berikut telah dikeluarkan pada 2019.

Publications

Besides updates on developments at the Commission, news and trends in the local, regional, and global energy industry are disseminated by the Commission through various publications.

The following publications were produced in 2019.

MAJALAH ENERGY MALAYSIA
ENERGY MALAYSIA MAGAZINES

TINJAUAN INDUSTRI
INDUSTRY OUTLOOK

LAPORAN IMBANGAN TENAGA NEGARA
NATIONAL ENERGY BALANCE REPORT

BUKU PANDUAN PEPERIKSAAN
EXAMINATION GUIDELINES

BAB 06
CHAPTER 06

PEMBANGUNAN KAPASITI DAN KEUPAYAAN

CAPACITY AND CAPABILITY DEVELOPMENT

16 tahun selepas penubuhan pada 2002, ST telah menerima guna sebuah visi baharu - untuk menjadi sebuah badan kawal selia sektor tenaga bertaraf dunia yang berkesan dan berwibawa - bagi menghadapi cabaran dan harapan baharu dalam industri pembekalan tenaga.

Bagi merealisasikan aspirasi ini, ST sedang merangka pelan perniagaan sehingga 2025. Sementara itu, sebagai persediaan untuk pelaksanaan pelan perniagaan yang baharu ini, ST giat mengukuhkan kapasitinya melalui pembentukan sistem dan struktur fungsi yang baharu, sejajar dengan keperluan Kerajaan serta amalan-amalan terbaik antarabangsa. Pada masa yang sama, pembangunan kakitangan profesional juga diutamakan demi membina tenaga kerja yang unggul dan berbakat serta mampu memenuhi kehendak pihak pemegang taruh dan menghadapi cabaran industri.

16 years after its formation in 2002, the Commission adopted a new vision - to be a world class energy regulator that is effective and authoritative – to respond to the new expectations and challenges in the energy supply industry.

To realise this aspiration, the Commission is developing a business plan to provide the strategic direction up to 2025. Meanwhile, in readiness for the implementation of a new business plan, the Commission has been strengthening capacity with new functional structures and systems, which are aligned to Government requirements and international best practices. At the same time, professional staff development is being prioritised to build a superior workforce with the capabilities to deliver stakeholder expectations and overcome industry challenges.

SOROTAN 2019
2019 HIGHLIGHTS

- Dua kursus pembangunan kepimpinan pengurusan baharu telah diperkenalkan pada 2019, untuk barisan pengurusan tertinggi dan pengurusan pertengahan, melalui kolaborasi bersama Harvard Business School Malaysia dan Universiti Putra Malaysia (UPM).
- ST telah memperkenalkan Terma dan Syarat Perkhidmatan yang lebih menarik bagi mengekalkan dan menarik bakat baharu, mulai 1 Mac 2019.
- Fungsi Audit Dalaman diperluaskan untuk merangkumi skop baharu iaitu Integriti ke dalam skop kerjanya; Jawatankuasa Anti Rasuah dan Jawatankuasa Kerja Integriti telah ditubuhkan pada bulan September; KPE ST juga telah menandatangani Ikrar Bebas Rasuah sementara kakitangan telah melafazkan ikrar tersebut pada bulan November.
- Pada penghujung 2019, seramai lapan kakitangan sedang melanjutkan pelajaran dalam bidang pengurusan tenaga, kewangan serta pengurusan risiko keselamatan dan kesihatan pekerjaan di bawah Skim Biasiswa ST.

- Two new management leadership development courses were introduced in 2019, for senior management and middle management, in collaboration with the Harvard Business School Malaysia and Universiti Putra Malaysia (UPM).
- The Commission introduced improved Terms and Conditions of Service to retain and attract talent, effective 1 March 2019.
- The Internal Audit function was expanded to include Integrity as part of its scope; the Anti-Corruption Committee and Integrity Working Committee was formed in September; the Commission's CEO signed the Corruption-Free Pledge while the staff took the oath in November.
- As at end 2019, there were eight staff pursuing post-graduate courses in energy management, finance as well as occupational safety and health risk management under the Commission's Scholarship Scheme.

PEMBANGUNAN KAPASITI DAN KEUPAYAAN

PEMBANGUNAN KAPASITI
CAPACITY DEVELOPMENT

Sektor tenaga di Malaysia telah mengalami perubahan ketara sejak tahun 90-an. Bermula daripada matlamat awalnya untuk membekal tenaga elektrik ke seluruh negara, sektor tenaga kini dipacu oleh usaha Kerajaan untuk meningkatkan keberterusan dan kemampanan tenaga, meningkatkan kecekapan dan kualiti perlaksanaan perkhidmatan, dan meningkatkan penyertaan sektor swasta dalam pembangunan infrastruktur industri tenaga.

Pembangunan Pelan Perniagaan ST 2021-2025

Industri tenaga sedunia kini sedang dalam proses perubahan. Maka, keperluan untuk mempunyai pelan perniagaan adalah kritikal bagi membentuk hala tuju dan merebut segala peluang yang bakal wujud dalam tempoh peralihan ini, dan pada masa yang sama bersedia untuk menangani cabaran-cabaran yang mendatang.

Pada awal 2018, ST telah membentangkan rancangannya untuk membangunkan Pelan Perniagaan 2021-2025 sebagai hala tuju strategik bagi tempoh lima tahun akan datang. Seperti mana dahulu, Pelan ini akan digunapakai sebagai panduan kepada pihak pengurusan dalam merancang, melaksana dan memantau kemajuan industri pembekalan tenaga dengan lebih sistematik dalam tempoh masa yang telah ditetapkan.

Malaysia's energy sector has undergone significant changes since the 1990s. From the initial goal for the electrification of the nation, it is now driven by the Government's efforts to improve energy security and sustainability, improve efficiency and quality of service delivery, and increase private sector participation in infrastructure development in the energy industry.

Development of the Commission's 2021-2025 Business Plan

Today, the global energy industry is in a state of transition. It is thus critical to have a business plan to provide direction and seize opportunities likely to arise during this transition, while managing the challenges it poses.

In early 2018, the Commission tabled plans for the development of its 2021-2025 Business Plan as its strategic 5-year road map. As in the past, the Plan will guide the management to organise, implement, and monitor the progress of the energy supply industry in a systematic manner within a set time frame.

Pelan Perniagaan ST 2021-2025, berdasarkan Enam Teras Asas
The Commission's 2021-2025 Business Plan, based on Six Core Thrusts

Daya Harap dan Kualiti Perkhidmatan Industri Pembekalan Elektrik dan Gas Berpaip Reliability and Service Quality in the Electricity and Gas Supply Industry	Keselamatan dalam Pembekalan dan Penggunaan Elektrik dan Gas Berpaip Safety in the Supply and Use of Electricity And Piped Gas	Keberterusan dan Kemampanan Tenaga Energy Security and Sustainability
Kecekapan Ekonomi dan Kemampuan dalam Industri Pembekalan Elektrik dan Gas Berpaip Economic Efficiency and Affordability in the Electricity and Piped Gas Supply Industry	Kualiti Kawal Selia dan Pelaksanaan Perkhidmatan Regulatory Quality and Service Delivery	Pembangunan Kapasiti dan Keupayaan Capacity and Capability Building

Teras-teras strategik ini adalah asas kepada peranan ST di dalam industri pembekalan elektrik dan gas berpaip, iaitu mengimbangi keperluan ekonomi dan sosial sambil menangani isu-isu alam sekitar.

These strategic thrusts are fundamental to the Commission's role in the electricity and piped gas supply industry, which is based on balancing the economic and social needs of the country while addressing environmental concerns.

CAPACITY AND CAPABILITY DEVELOPMENT

Matlamat Pelan Perniagaan ST 2021-2025

Pelan Perniagaan ST 2021-2025 akan digunapakai sebagai dokumen rasmi yang menetapkan hala tuju strategik dan fokus bagi membolehkan ST untuk melaksanakan fungsinya bagi tempoh lima tahun yang akan datang.

Ianya juga membantu ST mencapai visi baharunya - iaitu untuk menjadi badan kawal selia sektor tenaga bertaraf dunia yang berkesan serta berwibawa - seperti yang telah dipersetujui oleh anggota ST pada tahun 2018.

Selain itu, penyediaan Pelan Perniagaan juga mengambil kira perkembangan sektor tenaga negara, terutamanya inisiatif pembaharuan Industri Bekalan Elektrik Malaysia (MESI) 2.0 dari tahun 2019-2028.

Goals of the Commission's 2021-2025 Business Plan

The Commission's 2021-2025 Business Plan will be the official document to provide the strategic direction and focus for the Commission to perform its functions over the next five years.

It is to help chart the realisation of the Commission's new vision – to be a world class energy regulator that is effective and authoritative – that was approved by the Commission members in 2018.

In addition, the preparation of the Business Plan took account of the growth of the national energy sector, and especially the reform initiatives to be introduced under the Malaysian Electricity Supply Industry (MESI) 2.0 from 2019-2028.

Pencapaian Penting Pelan Peniagaan ST 2021-2025

Milestones of ST Business Plan 2021-2025

1.

Pelaksanaan program Solar Berskala Besar (LSS)
The implementation of the Large Scale Solar (LSS) programme

2.

Penguatkuasaan Akta Kecekapan Tenaga dan Konservasi (EECA)
The enforcement of the Energy Efficiency and Conservation Act (EECA)

3.

Pelaksanaan pembaharuan MESI 2.0 seperti berikut:

- Pembukaan sumber pembekalan bahan api
- Penjanaan hibrid untuk pengembangan pasaran
- Pengawalseliaan Akses Pihak Ketiga (TPA) untuk pembekalan elektrik
- Pengawalseliaan pasaran runcit terbuka untuk pembekalan elektrik

The implementation of MESI 2.0 reforms such as:

- Open fuel sourcing
- Hybrid generation for market development
- Regulation of Third Party Access (TPA) for electricity supply
- Regulation of the open retail market for electricity supply

Sebagai persediaan untuk menghadapi kebarangkalian dan ketidakpastian masa akan datang, Pelan ini turut merangkumi pembolehubah seperti berikut:

In anticipation of future possibilities and uncertainties, the Plan will also incorporate the following variables:

Peramalan teknologi, Revolusi Industri 4.0, Internet Pelbagai Benda (IoT), pendigitalan, penggunaan meter pintar dan lain-lain teknologi
Technology forecasting, Industry Revolution 4.0, Internet of Things (IoT), digitalisation, smart metering and other technologies

Senario-senario ekonomi dan industri - seperti desentralisasi, peningkatan persaingan, sasaran Tenaga Boleh Baharu (TBB)
Economic and industry scenarios – such as decentralisation, increased competition, Renewable Energy (RE) targets

Undang-undang baharu ataupun pindaan
New legislations or amendments

PEMBANGUNAN KAPASITI DAN KEUPAYAAN

Audit Dalaman dan Integriti

Pada 1 September 2019, ST telah menambahkan skop Integriti di dalam fungsi Audit Dalamannya yang merupakan keperluan mandatori Pelan Anti Rasuah Nasional 2019-2023 yang telah dilancarkan oleh Perdana Menteri Malaysia pada 29 Januari 2019.

Bagi 2019, ST telah mengeluarkan sembilan laporan audit. Ini adalah hasil daripada 10 audit operasi yang terancang di lapan pejabat kawasannya dan audit ISMS 27001 bagi Unit Pengurusan Teknologi Maklumat ST. Pengauditan mendapati bahawa kawalan dalaman adalah memuaskan bagi mengurangkan risiko-risiko yang telah dikenalpasti dan juga beroperasi secara efektif dalam melindungi kepentingan ST.

Jawatankuasa Audit Dalaman dan Integriti terdiri daripada pengerusi dan dua orang wakil daripada Anggota ST. Sepanjang 2019, Jawatankuasa ini telah bersidang sebanyak empat kali, dengan korum penuh.

Internal Audit and Integrity

On 1 September 2019, the Commission added Integrity to the Commission's Internal Audit function which is a mandatory requirement of the National Anti-Corruption Plan 2019-2023 launched by the Prime Minister on January 29, 2019.

In 2019, the Commission produced nine audit reports. They are the result of 10 planned operational audits of eight regional offices and the ISMS 27001 audit of the Commission's Information Technology Management Unit. The audits found that the internal controls are satisfactorily in place to mitigate some of the risks identified and are also operating effectively in safeguarding the Commission's interest.

The Internal Audit and Integrity Committee consists of a chairman and two representatives from the Commission Members. In 2019, the Committee held four meetings, with a full quorum.

Audit Dalaman dan Integriti: Skop Kerja
Internal Audit and Integrity: Scope of Work

Audit Dalaman dan Integriti ST menggunakan pendekatan berasaskan risiko dalam membangunkan pelan audit tahunannya. Pelan audit tahunan ini dikaji secara berkala untuk menampung sebarang perubahan dari segi risiko serta persekitaran operasi.

Skop pengauditan menggunakan pendekatan *audit universe* di mana ianya merangkumi pelbagai fungsi seperti tadbir urus, pengurusan risiko dan kajian semula kawalan dalaman tanpa terhad.

The Commission's Internal Audit and Integrity adopts the risk-based approach to develop its annual audit plan. The annual audit plan is reviewed periodically to accommodate changes that have occurred in terms of risk and the operating environment.

For areas of audit, the audit universe approach is applied, this covers various functions such as governance, risk management and the review of unrestricted internal control.

Pelan Anti Rasuah Organisasi
Organisational Anti-Corruption Plan

ST telah memulakan pembangunan *Organisational Anti Corruption Plan* (OACP) pada September 2019, dengan pembentukan suatu Jawatankuasa Anti Rasuah dan Jawatankuasa Kerja Integriti untuk membincangkan isi kandungan dan hasil akhir bagi dokumen tersebut.

The Commission initiated the development of the Organisational Anti Corruption Plan (OACP) in September 2019, with the establishment of the Anti-Corruption Committee and the Integrity Working Committee to deliberate on its contents and final output.

CAPACITY AND CAPABILITY DEVELOPMENT

PEMBANGUNAN KEUPAYAAN
CAPABILITY DEVELOPMENT

Keupayaan Organisasi dan Profil Kakitangan

Komposisi kakitangan pelbagai latar belakang adalah penting bagi mencapai matlamat dan visi ST. Sebahagian besar daripada kakitangan eksekutif (78%) merupakan graduan kejuruteraan, sementara yang lain (22%) merupakan graduan undang-undang, ekonomi, kewangan, perakaunan, pengurusan perniagaan, sains komputer dan komunikasi massa.

Pada akhir 2019, terdapat 231 orang atau 69% kakitangan eksekutif, dalam mana jawatan rendah (46%), pertengahan (20%) dan pengurusan kanan (3%). Baki 104 orang (31%) lagi adalah kakitangan bukan eksekutif.

Jabatan Penguatkuasaan dan Operasi Kawasan mempunyai tenaga kerja terbesar, iaitu seramai 96 kakitangan, diikuti oleh Jabatan Operasi Industri (30 kakitangan), Jabatan Kawal Selia Keselamatan (27 kakitangan) dan Jabatan Perkhidmatan Korporat (27 kakitangan).

Organisational Capabilities and Staff Profile

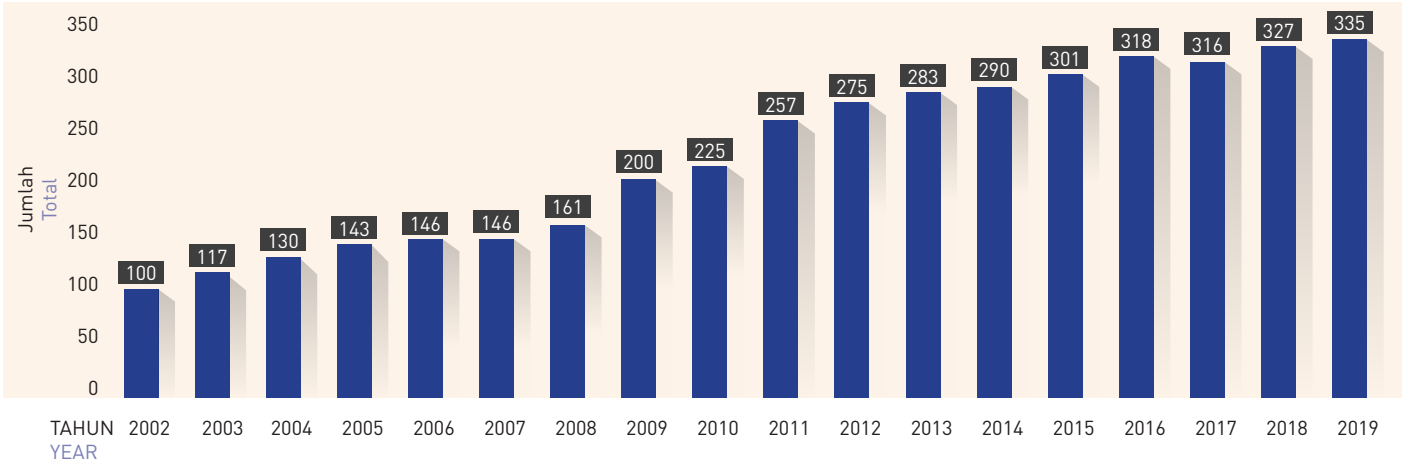
A diversified staff composition is crucial in realising the Commission's goal and vision. The majority of executives (78%) are engineering graduates, while the rest (22%) are graduates of law, economics, finance, accounting, business administration, computer science and mass communication.

At the end of 2019, there were 231 executives who made up 69% of the staff at lower (46%), middle (20%) and senior managerial positions (3%). The remaining 104 staff (31%) were non-executives.

The Enforcement and Regional Operations Department had the largest workforce, at 96, followed by Industry Operations Department (30 staff), Safety Regulation Department (27 staff) and Corporate Services Department (27 staff).

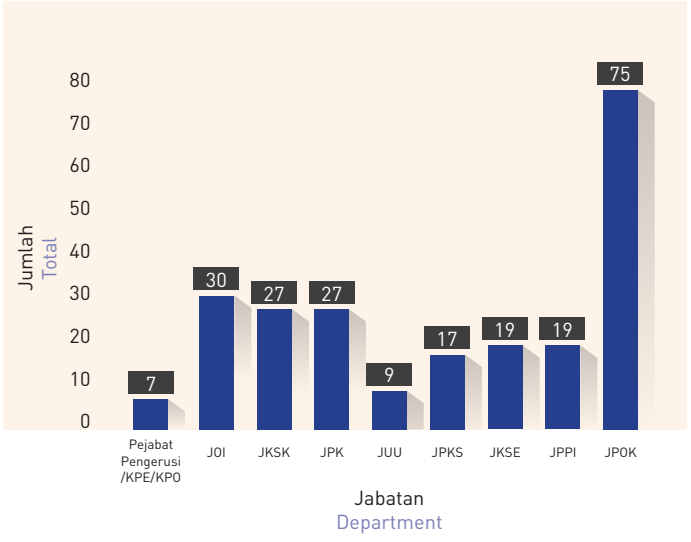
PEMBANGUNAN KAPASITI DAN KEUPAYAAN

Bilangan Kakitangan, 2002-2019
Number of Staff, 2002-2019

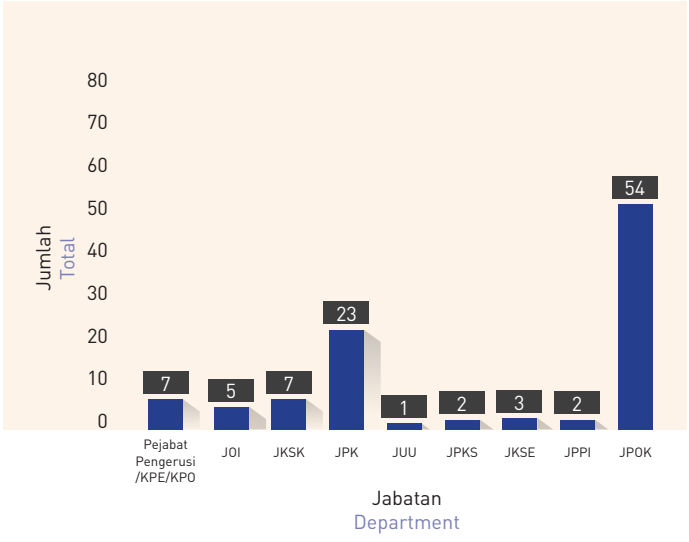


Kakitangan mengikut Jabatan
Staff by Department

Eksekutif
Executive



Bukan Eksekutif
Non-Executive



KPE – Pejabat Ketua Pegawai Eksekutif
Office of Chief Executive Officer

KPO – Pejabat Ketua Pegawai Operasi
Office of Chief Operating Officer

JOI – Jabatan Operasi Industri
Industry Operations Department

JKSK –Jabatan Kawal Selia Keselamatan
Safety Regulation Department

JPK –Jabatan Perkhidmatan Korporat
Corporate Services Department

JUU – Jabatan Undang Undang dan Pengurusan Risiko
Legal and Risk Management Department

JPKS- Jabatan Perancangan dan Komunikasi Strategik
Strategic Planning and Communication Department

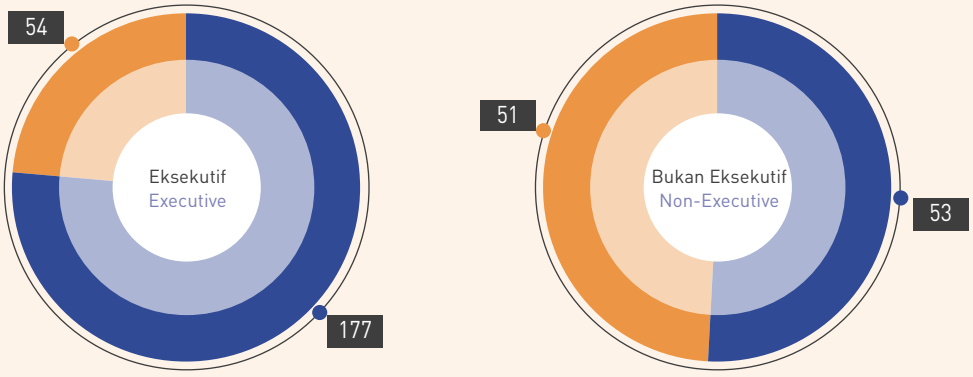
JKSE – Jabatan Kawal Selia Ekonomi
Economic Regulation Department

JPPI – Jabatan Perancangan dan Pembangunan Industri
Industrial Planning and Development Department

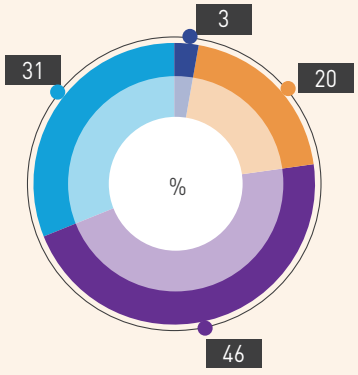
JPOK – Jabatan Pengkuatkuasaan dan Operasi Kawasan
Enforcement and Regional Operations Department

CAPACITY AND CAPABILITY DEVELOPMENT

Kakitangan Mengikut Lokasi
Staff by Location

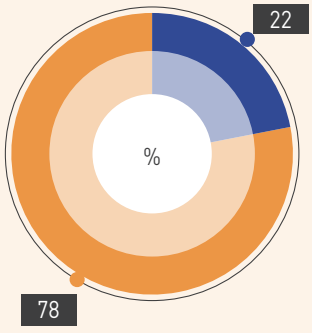


Kakitangan Mengikut Kategori
Staff by Category



Pengurusan Tertinggi Senior Management	3%
Pengurusan Pertengahan Middle Management	20%
Pengurusan Rendah Junior Management	46%
Bukan Eksekutif Non Executive	31%

Kakitangan Mengikut Bidang Pengajian
Staff by Field of Study



Bidang kejuruteraan: elektrik, electronik, mekanical, kimia etc Engineering fields: electrical, electronic, mechanical, chemical, etc	78%
Bidang pelajaran lain: undang undang, ekonomi, kewangan, perakaunan, pentadbiran perniagaan, sains komputer, komunikasi massa Other fields of study: law, economics, finance, accounting, business administration, computer science, mass communications.	22%

PEMBANGUNAN KAPASITI DAN KEUPAYAAN

Inisiatif Sumber Manusia 2019

ST adalah komited dalam usaha memupuk budaya pembangunan kerjaya di kalangan tenaga kerjanya, terutamanya dalam bidang-bidang seperti ekonomi, industri pasaran tenaga dan kejuruteraan elektrik dan gas.

Tahun ini telah menyaksikan peningkatan bilangan dan kepakaran tenaga kerja ST sebanyak 10% iaitu melalui perlantikan tujuh orang pakar teknikal serta pelaksanaan kenaikan aras kerjaya sebanyak dua kali setahun yang melibatkan 16 orang kakitangan yang layak.

Skor purata Indeks Kepuasan Pekerja ST telah meningkat, daripada 3.43 pada 2018 kepada 3.50 pada 2019 yang dikategorikan di tahap "Sederhana ke Baik". Ini adalah hasil daripada pelaksanaan Kajian 3P (Peranan, Persekitaran dan Pembangunan) yang menilaikan peranan, persekitaran tempat kerja dan pembangunan kakitangan.

Di samping itu, ST juga telah melaksanakan program *employee engagement* sebagai strategi bagi meningkatkan produktiviti dan mengekalkan kakitangan yang berkaliber tinggi. Ini juga merupakan strategi bagi memastikan pelarasan peranan dan tanggungjawab di antara ibu pejabat dan pejabat kawasan bagi mencapai aspirasi dan nilai-nilai teras ST.

Sepanjang 2019, sebanyak sembilan sesi *employee engagement* bagi perkara-perkara berkaitan pengurusan sumber manusia telah diadakan di pejabat-pejabat kawasan ST.

Antara acara kemuncak adalah taklimat berkenaan pindaan pada Terma dan Syarat Perkhidmatan ST pada tahun 2019. Sesi ini juga melibatkan perkongsian dan maklumbalas mengenai perkara-perkara berkaitan pengurusan sumber manusia.

Human Resources Initiatives 2019

The Commission is committed to fostering career development in the workforce, especially in fields such as economics, energy industry marketing, and electrical and gas engineering.

The year saw a 10% increase in the number of professional expertise employed following the appointment of seven technical experts as well as two promotion exercises that saw the elevation of 16 qualified professionals.

The Commission's Employee Satisfaction Index ranking moved up, from an average score of 3.43 in 2018 to 3.50 in 2019 which falls within the "Average to Good" category. This is the outcome of the implementation of the 3Ps Study *(Peranan, Persekitaran dan Pembangunan)* study that evaluated the role, workplace and development of staff.

In addition, the Commission implements the employee engagement programme as a strategy to enhance productivity and to retain high calibre staff. This is also a strategy to ensure the alignment of the roles and responsibilities between the head office and regional offices to achieve the Commission's values and aspirations.

In 2019, there were nine employee engagement sessions on matters relating to human resource management that were held at the Commission's regional offices.

Among the highlights were briefings on the Commission's amended Terms and Conditions of Service in 2019. These sessions also involved much sharing and feedback on human resources management matters.

Program *Employee Engagement* Sumber Manuasia pada 2019
Human Resource Employee Engagement Programmes in 2019

September	:	Selangor, WP KL & Putrajaya
September	:	Negeri Sembilan dan Melaka
	:	Johor
Oktober	:	Perak
October	:	Pahang
	:	Pulau Pinang, Kedah dan Perlis
	:	Kelantan dan Terengganu
November	:	Pantai Timur Sabah
November	:	Pantai Barat Sabah

CAPACITY AND CAPABILITY DEVELOPMENT

Pindaan Terma Dan Syarat Perkhidmatan ST

Untuk meningkatkan prospek pengekalan bakat sedia ada dan dalam usaha menarik bakat baharu, beberapa pindaan telah dibuat kepada Terma dan Syarat Perkhidmatan yang sedia ada.

Dengan Terma dan Syarat Perkhidmatan yang lebih baik ini, kakitangan akan lebih bermotivasi untuk meningkatkan pengetahuan serta kompetensi mereka dalam pembangunan profesional masing-masing melalui budaya pembelajaran yang berterusan. Ini adalah penting kerana kakitangan ST berperanan penting dalam memastikan industri pembekalan tenaga di Malaysia diiktiraf sebagai suatu industri yang berdaya harap, selamat dan mampan demi memacu pembangunan negara.

Mulai 1 Mac 2019, ST telah melaksanakan pindaan yang melibatkan kemudahan kakitangan seperti berikut:

Amendments to the Commission's Terms And Conditions of Service

To improve the prospects of retaining existing talent and attracting new ones, amendments were made to the existing Terms and Conditions of Service.

It is also envisaged that with better Terms and Conditions of Service, staff will be motivated to gain more knowledge and competence as part of their professional development through a continuous learning culture. This is important because the Commission's staff play a vital role in ensuring the good standing of the Malaysian energy supply industry, to be recognised as one that is reliable, safe and sustainable to drive national development.

Effective 1 March 2019, the Commission implemented amendments that cover the following staff benefits:

Program Latihan dan Pembangunan Kakitangan

Bagi merealisasikan visi ST untuk menjadi sebuah badan kawal selia sektor tenaga bertaraf dunia yang berkesan dan berwibawa, ST memerlukan barisan tenaga kerja yang berkepakaran dan bermotivasi tinggi serta mampu menyusun dan merancang strategi, di samping melaksanakan pelbagai inisiatif. Untuk memastikan warga kerjanya dilengkapi dengan pengetahuan dan kompetensi yang perlu untuk melaksanakan tugas mereka, ST memberi keutamaan kepada latihan dan pembangunan kakitangan di semua peringkat.

Kalendar Latihan 2019

Seperti tahun-tahun sebelumnya, ST menetapkan setiap kakitangan perlu menjalani program latihan dan pembangunan sebagai sebahagian daripada pembangunan profesional masing-masing, iaitu minimum tujuh hari setiap tahun bagi kakitangan eksekutif dan empat hari setiap tahun bagi kakitangan bukan eksekutif. Pada 2019, purata pencapaian bagi sasaran kehadiran tahunan kursus latihan adalah sebanyak 94%.

Kalendar Latihan dan Pembangunan Kakitangan 2019 merangkumi 203 kursus - kemahiran pengurusan, kemahiran insaniah dan kemahiran teknikal yang berkaitan dengan fungsi utama ST sebagai pengawal selia tenaga. Daripada jumlah ini, sebanyak 76 kursus telah dilaksanakan secara latihan dalaman dan 127 lagi secara latihan luaran.

Staff Training and Development Programmes

The realisation of the Commission's vision to become a world-class energy regulator that is effective and authoritative requires a highly competent and motivated workforce that can strategise, plan and implement various initiatives. To ensure staff have the appropriate knowledge and competencies to carry out their duties, the Commission gives priority to staff training and development at all levels.

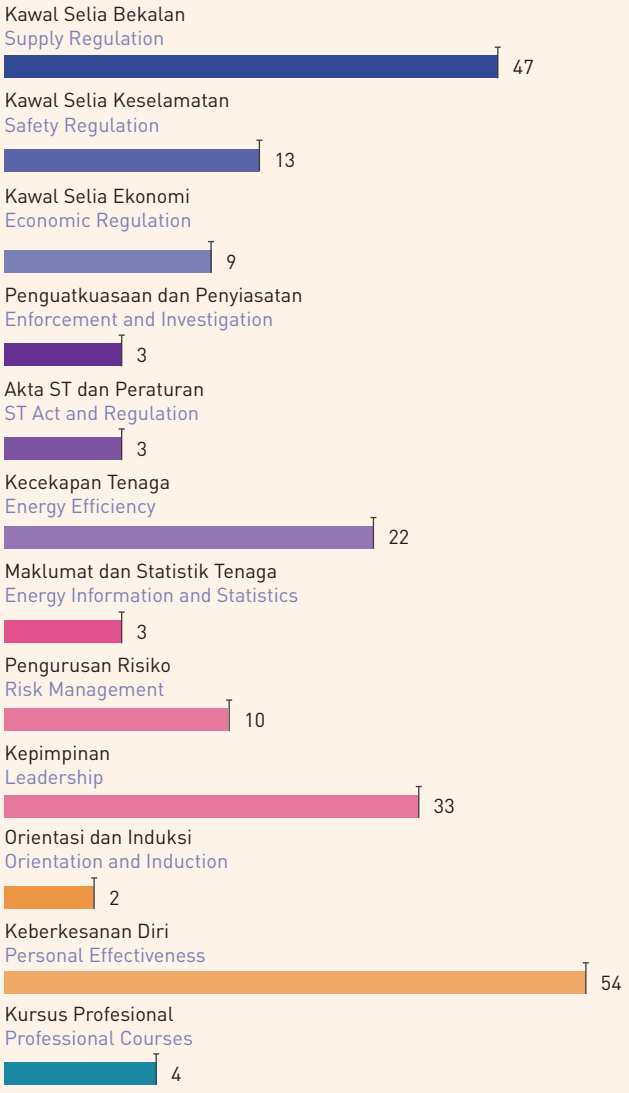
2019 Training Calendar

As in previous years, the Commission requires all staff to attend training and development programmes as part of their professional development. It is a minimum of seven days per year for executive staff and four days per year for non-executive staff. In 2019, the average annual attendance for the training courses achieved was 94%.

The 2019 Staff Training and Development calendar covered 203 courses - for management skills, soft skills and technical skills related to the Commission's primary functions as an energy regulator. Of this, 76 were conducted internally and the remaining 127 externally.

PEMBANGUNAN KAPASITI DAN KEUPAYAAN

Bilangan Kursus Latihan dan Kehadiran Mengikut Kategori pada 2019
Number of Training Organised and Attended by Category in 2019



Program Kepimpinan Barisan Pengurusan

ST telah memperkukuhkan lagi program pembangunan untuk kakitangan pengurusan tertinggi dan pertengahan di bawah *Senior Management Development Programme* dan *Middle Management Development Programme*. Sejumlah 54 program pembangunan kepimpinan telah dirancang di mana 97% program telah dilaksanakan.

Program-program latihan yang dianjurkan termasuklah pembangunan kompetensi kepimpinan di dalam bidang komunikasi dan rundingan, pengurusan strategik, penyelesaian masalah, bimbingan dan *mentoring* serta pembangunan kepintaran pengurusan. Ia merupakan sebahagian daripada *Senior Management Development Programme* anjuran Harvard Business School Malaysia dan kursus *Executive Overseas Programme* (EXOP) anjuran UPM.

Skim Biasiswa ST

Dalam usaha menggalakkan budaya pembelajaran berterusan, ST telah menganjurkan skim Pembiayaan Biasiswa bagi kakitangan yang berminat untuk melanjutkan pengajian pasca siswazah (program Sarjana atau Kedoktoran) secara separuh masa, dalam bidang-bidang yang berkaitan dengan fungsi dan tanggungjawab ST.

Management Leadership Programmes

The Commission strengthened leadership development programmes for top and middle management staff under the Senior Management and Middle Management Development Programmmes. A total of 54 leadership development programmes were planned and 97% were implemented.

The programmes included leadership competencies in the fields of communication and negotiation, strategic management, problem solving, coaching and mentoring as well as leadership acumen development. This was part of the Senior Management Development Programme organised by the Harvard Business School Malaysia and the Executive Overseas Programme (EXOP) by UPM.

The Commission's Scholarship Scheme

To promote a culture of continuous learning, the Commission has a scholarship scheme that is open to staff keen to pursue part time post graduate studies (Masters or PhD) in subjects related to the Commission's functions and responsibilities.

CAPACITY AND CAPABILITY DEVELOPMENT

Pada 2019, ST telah bekerjasama dengan Kementerin dalam membiayai kakitangan yang ingin melanjutkan pelajaran di bawah program Sarjana dalam Sains Profesional Akademik UTM-MESTECC. Suruhanjaya juga turut membuka peluang untuk kakitangan mendapatkan pensijilan di dalam bidang profesional dan kemahiran diri seperti jurutera profesional dan sebagainya, sebagai usaha untuk meningkatkan tahap kompetensi kakitangan.

In 2019, the Commission collaborated with the Ministry to fund staff who wish to further their studies under the UTM-MESTECC Masters programme in Academic Professional Science. In an effort to increase staff competency, the Commission also offered opportunities for staff to obtain certification in the field of professional and personal skills such as professional engineering, among others.

2019

Jumlah pembiayaan biasiswa
Total scholarships awarded

5 program Sarjana
Masters programmes

Jumlah bekerja dan belajar
Total working and studying

8 program Sarjana
Masters programmes

Anugerah Biasiswa ST

Di antara 2016 dan 2019, seramai lapan kakitangan telah memohon dan diluluskan untuk mendapat pembiayaan biasiswa ST, berdasarkan syarat-syarat yang ditetapkan.

ST Scholarship Awards

Between 2016 and 2019, eight employees applied for the Commission's scholarship, which was approved based on the terms and conditions stipulated in the scheme.

Nama Kakitangan Staff Name	Program Pengajian Study Programme	Bidang Pengajian Field of Study	Institusi/Universiti Institute/University
Zamali Zamin	Sarjana Masters	Pentadbiran Perniagaan Business Administration	Universiti Teknologi Mara, Shah Alam, Selangor
Ir. Sharal Aida Ibrahim	Sarjana Masters	Kejuruteraan (Elektrik Kuasa) Engineering (Electrical Power)	Universiti Teknologi Malaysia, KL
Ir. Mohamad Nor Othman	Sarjana Masters	Sains (Kejuruteraan Sistem Elektrik) Science (Electrical System Engineering)	Universiti Malaysia Perlis
Nur Hamiza Mirsa Hussain	Sarjana Masters	Sains (Pengurusan Tenaga) Science (Energy Management)	Universiti Teknologi Malaysia (UTM)
Ahmad Firdaus Kamarazaman	Sarjana Masters	Sains (Pengurusan Tenaga) Science (Energy Management)	Universiti Teknologi Malaysia (UTM)
Mohamed Nadhir Zainal Abidin	Sarjana Masters	Sains (Pengurusan Tenaga) Science (Energy Management)	Universiti Teknologi Malaysia (UTM)
Nurul Ain Redzuan	Sarjana Masters	Pentadbiran Perniagaan (Kewangan) Business Administration (Finance)	Universiti Putra Malaysia (UPM)
Hisyamudin Harun	Sarjana Masters	Pengurusan Keselamatan dan Kesihatan Pekerjaan Occupational Safety & Health Risk Management	Universiti Terbuka Malaysia (OUM)

PEMBANGUNAN KAPASITI DAN KEUPAYAAN

Program *Employee Engagement*
Employee Engagement Programmes

Mesyuarat Majlis Bersama Jabatan (MBJ)
Joint Departmental Council Meeting (MBJ)

Majlis Bersama Jabatan (MBJ) telah ditubuhkan pada tahun 2004, sebagai saluran komunikasi dua hala antara pihak pekerja dan pihak Pengurusan. Matlamatnya adalah untuk menggalakkan kakitangan menyuarakan pendapat, pandangan serta menyumbangkan idea-idea yang dapat memanfaatkan ST.

Ahli majlis mewakili kesemua kategori kakitangan dan setiap ahli yang dilantik akan menyandang jawatan tersebut selama tempoh tiga tahun. Barisan Majlis 2019-2021 telah dipilih pada 4 Oktober 2019 di mana mesyuarat pertama MBJ telah bersidang pada November 2019. Mesyuarat tersebut telah membangkitkan pelbagai perkara berkaitan dengan prestasi organisasi dan kebajikan kakitangan, untuk dibincangkan bagi tindakan pihak pekerja dan pengurusan. Antara perkara-perkara dibincangkan termasuklah mengenai waktu kerja anjal yang telah diluluskan oleh Kementerian untuk dilaksanakan di ST mulai 1 Januari 2020. Ianya adalah bertujuan untuk memberi keseimbangan kerja dan kehidupan kepada kakitangan.

The Joint Departmental Council (MBJ) was established in 2004, to serve as a two-way communication channel between employees and the Management. The goal is to encourage staff to voice their opinions, views and contribute ideas for the benefit of the Commission.

Council members represent all categories of staff and serve a 3-year term. A new line-up of the 2019-2021 Council was selected on 4 October 2019, and held its first meeting in November 2019. The meeting raised various matters relating to the performance of the organisation and staff welfare, to be tabled for action by the staff and the management. Among the matters tabled included flexible working hours, which has been approved by the Ministry to be implemented on 1 January 2020. This is aimed at providing staff with better work-life balance.

Perhimpunan Bulanan
Monthly Assembly

Objektif utama perhimpunan bulanan ini adalah penyebaran maklumat, serta perkongsian ilmu dan inisiatif-inisiatif terkini yang dilaksanakan oleh ST. Sepanjang 2019, lima perhimpunan bulanan telah diadakan.

Perhimpunan ini juga merupakan suatu platform di mana Pengerusi, Ketua Pegawai Eksekutif dan warga kerja dapat bertemu untuk bertukar idea dan pendapat. Sepanjang 2019, sesi perkongsian ilmu telah merangkumi topik-topik seperti kepentingan kemampanan alam sekitar, kecekapan sistem penjanaan, peningkatan kualiti pembekalan dan persediaan bagi menghadapi cabaran industri tenaga yang akan datang.

The primary objectives of the monthly assembly are the dissemination of information, knowledge sharing and updates on the latest developments at the Commission. In 2019, five monthly assemblies were held.

These assemblies also serve as a platform where the Chairman, Chief Executive Officer and staff can meet to exchange thoughts and ideas. In 2019, the knowledge sharing sessions covered subjects such as the significance of environmental sustainability, efficient generation systems, improving the quality of supply and preparation for the latest set of energy industry challenges to come.

CAPACITY AND CAPABILITY DEVELOPMENT

Perkongsian Maklumat Melalui *E-Newsletter* Terkini ST
Information Sharing With Terkini ST E-Newsletter

ST turut menerbitkan buletin elektronik iaitu Terkini ST yang diedarkan melalui emel dan intranet ST. Sepanjang 2019, tujuh terbitan Terkini ST telah dikeluarkan, masing-masing melaporkan aktiviti dan inisiatif yang telah dijalankan oleh ST.

Isi kandungan Terkini ST meliputi pelbagai topik, di mana ianya merangkumi maklumat terkini tentang program *stakeholder engagement*, aktiviti pengawalseliaan, pemeriksaan dan penguatkuasaan, lawatan dan kunjungan hormat, inisiatif tanggungjawab sosial korporat dan liputan berita di media.

The Commission publishes an e-newsletter called Terkini ST that is circulated via email and the ST intranet. In 2019, seven issues of Terkini ST were produced. They carry news to update staff on the various activities and initiatives carried out at the Commission.

The contents of Terkini ST is wide-ranging, with coverage of the latest information on the stakeholder engagement programmes to regulatory inspection and enforcement activities, familiarisation visits and courtesy calls, corporate social responsibility initiatives and news in the media.

BAB 07
CHAPTER 07

INISIATIF MENDAMPINGI KOMUNITI

COMMUNITY OUTREACH INITIATIVES

COMMUNITY OUTREACH INITIATIVES

KOMUNITI
COMMUNITY

Program Touchpoint

Program Touchpoint merupakan inisiatif Tanggungjawab Sosial Korporat utama ST yang dilancarkan pada tahun 2014 untuk meningkatkan kesedaran komuniti mengenai kepentingan pendawaian dan penggunaan elektrik secara cekap dan selamat.

Sepanjang 2019, program Touchpoint telah dijalankan di lapan premis di Semenanjung Malaysia dan Sabah.

Kos keseluruhan sebanyak RM10,000 telah diperuntukkan bagi setiap lokasi untuk kerja-kerja pendawaian, ujian dan penggantian kelengkapan elektrik dengan peralatan seperti lampu, kipas dan suis yang lebih selesa dan cekap. Alat Peranti Arus Baki (PAB) turut diganti di beberapa premis bagi melindungi penghuni premis daripada bahaya renjatan elektrik sekiranya berlaku kebocoran arus.

Touchpoint Programme

The Touchpoint programme is the Commission's flagship Corporate Social Responsibility initiative that was launched in 2014 to raise community awareness on the importance of safe wiring and efficient use of electricity.

In 2019, the Touchpoint programme reached out to eight premises in Peninsular Malaysia and Sabah.

A total of RM10,000 was allocated for each location, for wiring, testing and the replacement of electrical appliances with safer and more energy efficient lamps, fans, and switches. In some instances, the Electricity Residual Circuit Breaker (ERCB) was replaced to protect residents from electric shocks in the event of leakages.

INISIATIF MENDAMPINGI KOMUNITI

Program Touchpoint mengikut Kawasan pada 2019
Touchpoint Programmes by Region in 2019

Pulau Pinang, Perlis & Kedah

Okt / Oct

Pembaikpulihan sistem pendawaian dan kelengkapan elektrik di Madrasah Tarbiyatul Auladiyah Darul Ulum, Kampong Kilim.

Upgrading of wiring system and electrical appliances at Madrasah Tarbiyatul Auladiyah Darul Ulum, Kampong Kilim.

Perak

Okt / Oct

Pembaikpulihan sistem pendawaian di dua institusi iaitu Maahad Tahfiz Al-Quran Wal Qiraat di Kampung Dato Ahmad Said dan Rumah Yatim Budi Mulia Nurul Huda di Kampung Tersusun Tanah Hitam.

Upgrading of wiring system at two institutions, namely, Maahad Tahfiz Al-Quran Wal Qiraat in Kampung Dato Ahmad Said and Rumah Yatim Budi Mulia Nurul Huda in Kampung Tersusun Tanah Hitam.

Selangor, WP Kuala Lumpur & Putrajaya

Jul / Jul

ST telah memeriksa dan mengesahkan keselamatan bagi sistem pendawaian di Pusat Jagaan Titian OKU Nur, Rawang. Sistem tersebut telah dipasang oleh kontraktor yang berdaftar di bawah ST.

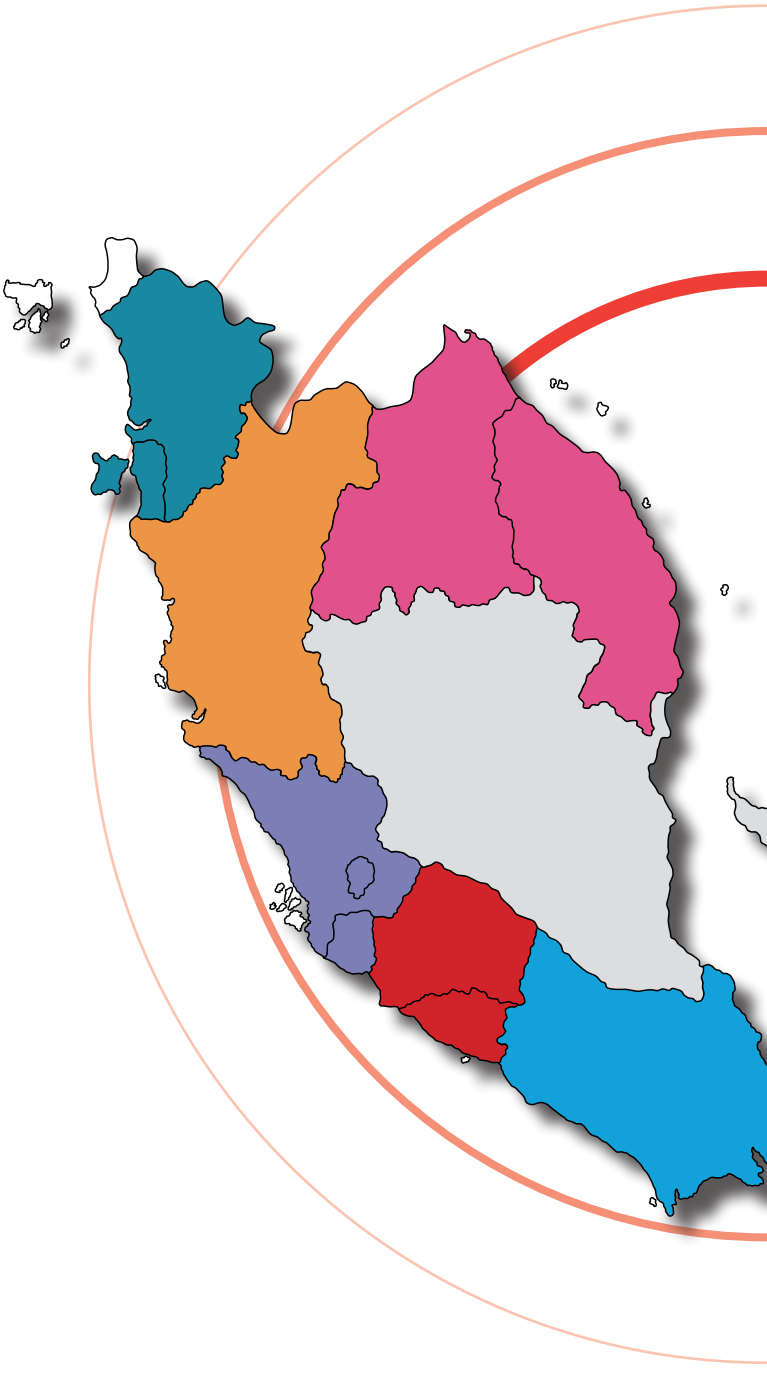
The Commission inspected and verified the safety of the wiring system at Pusat Jagaan Titian OKU Nur, Rawang. It was installed by authorised contractors registered with the Commission.

Negeri Sembilan & Melaka

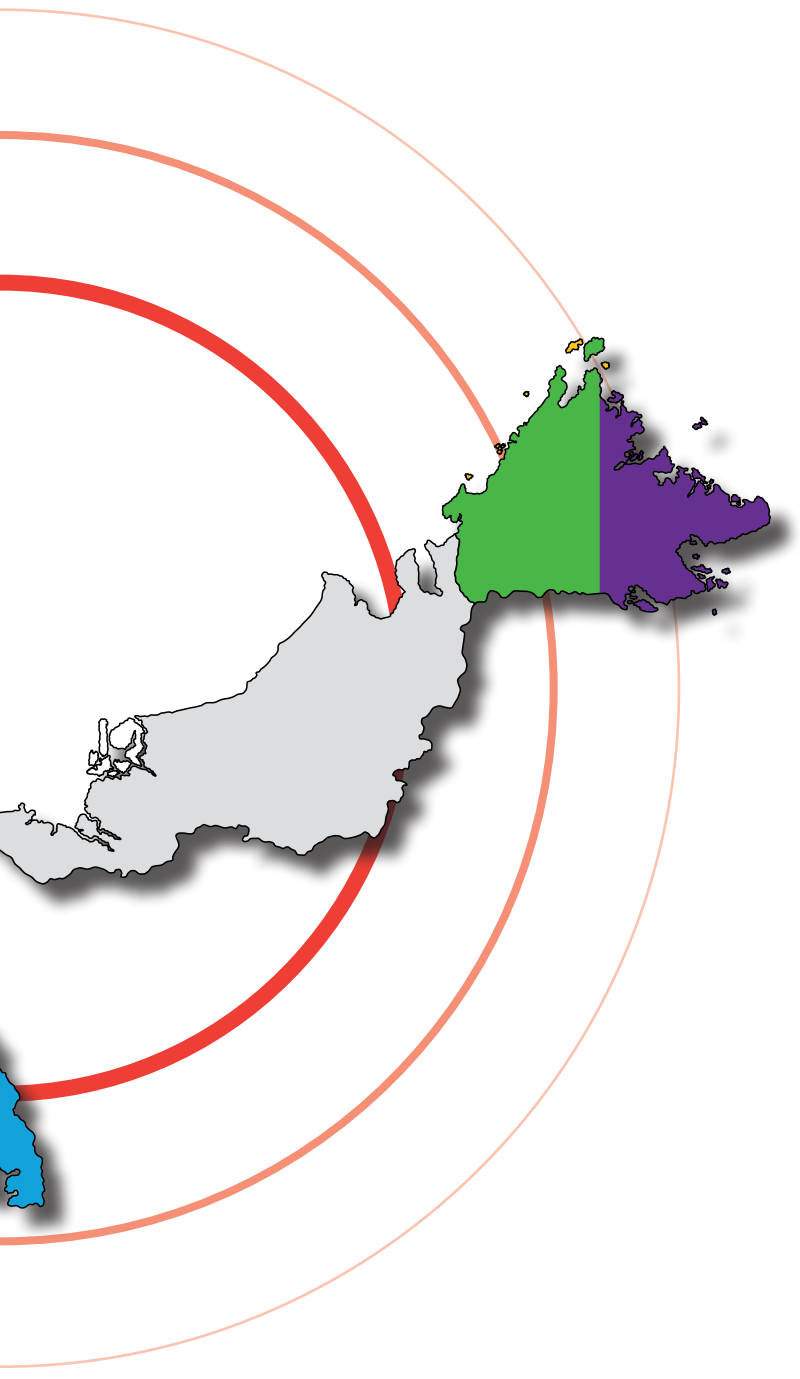
Mei / May

Pemeriksaan keselamatan sistem pendawaian di Tahfiz Pondok Darul Muttaqin di Paya Rumput. Sistem tersebut telah dipasang oleh kontraktor yang berdaftar di bawah ST.

Inspection of the safety of the wiring system at Tahfiz Pondok Darul Muttaqin in Paya Rumput. It was installed by authorised contractors registered with the Commission.



COMMUNITY OUTREACH INITIATIVES



Johor

Ogos
Aug

Pembaikan sistem pendawaian di Madrasah Tahfiz Al-Ikhsan di Muar.

Repairing of wiring system at Madrasah Tahfiz Al-Ikhsan in Muar.

Kelantan & Terengganu

Nov
Nov

Penukaran sistem pendawaian di Pusat Tahfiz Madrasatul Quran di Bukit Kenak, Jerteh.

Changing of wiring system at Pusat Tahfiz Madrasatul Quran in Bukit Kenak, Jerteh.

Pantai Timur Sabah
East Coast of Sabah

Apr
Apr

Pemeriksaan keselamatan sistem pendawaian di Sekolah Tahfiz Maahad Al-Itqon, Lilogah Wa'alquran di Program Perumahan Rakyat. Sistem tersebut telah dipasang oleh kontraktor yang berdaftar di bawah ST.

Inspection of the wiring system at Sekolah Tahfiz Maahad Al-Itqon, Lilogah Wa'alquran located in Program Perumahan Rakyat. It was installed by authorised contractors registered with the Commission.

Pantai Barat Sabah
West Coast of Sabah

Sep
Sept

Pembaikan sistem pendawaian di Kompleks Latihan & Pemulihan Orang Kurang Upaya Kimanis, sebuah pusat latihan dan pemulihan bagi orang kurang upaya.

Repairing the wiring system at Kompleks Latihan & Pemulihan Orang Kurang Upaya Kimanis, a training and rehabilitation centre for the differently abled.

INISIATIF MENDAMPINGI KOMUNITI

TOUCHPOINT SANDAKAN

Pendawaian Elektrik yang Lebih Selamat untuk Pusat Tahfiz di Sandakan

Pada bulan April 2019, ST telah memeriksa keselamatan sistem pendawaian elektrik dan juga telah memasang kelengkapan elektrik yang cekap tenaga di Maahad Al-Itqon Wa'alquran, sebuah pusat tahfiz di Sandakan yang sedang dalam pembinaan.

Menurut Pengarah Kawasan ST bagi Pantai Timur Sabah, Ir. Amir Faisal Khamshah, "Bagi program Touchpoint di Maahad Al-Itqon Wa'alquran, ST akan menyelia proses pendawaian elektrik di pusat tahfiz ini, dan sebanyak RM10,000 telah diperuntukkan untuk kerja-kerja pendawaian, pengujian dan pemasangan kelengkapan elektrik seperti kipas dan lampu di premis tersebut."

Menurutnya lagi, analisa keselamatan 2018 ST menunjukkan bahawa 41% kemalangan elektrik yang dilaporkan berpunca daripada pemasangan atau senggaraan pendawaian elektrik yang tidak sempurna. Sekitar satu perempat daripada kemalangan tersebut berlaku di kediaman rumah diikuti di kilang dan talian atas utiliti bervoltan tinggi.

Safer Electrical Wiring at a Tahfiz Centre in Sandakan

In April 2019, the Commission inspected the safety of the electrical wiring system and installed energy efficient appliances at Maahad Al-Itqon Wa'alquran, a tahfiz centre in Sandakan that was under construction.

According to the Commission's Regional Director for the East Coast of Sabah, Ir. Amir Faisal Khamshah, "For the Touchpoint programme at Maahad Al-Itqon Wa'alquran, the Commission supervised the electrical wiring at this tahfiz, and RM10,000 was allocated for the wiring, testing and installation works of electrical appliances such as fans and lights at the premises."

He added that the Commission's 2018 safety analysis showed that 41% of reported electrical accidents were caused by improper installation or maintenance of electrical wiring. About a quarter of these accidents occurred at residential homes followed by factories and high voltage overhead utility lines.

TOUCHPOINT RAWANG

Menaik Taraf Sistem Pendawaian Elektrik di Pusat Jagaan bagi Orang Kelainan Upaya di Rawang

Pada Julai 2019, ST telah memeriksa sistem pendawaian elektrik di Pusat Jagaan Titian OKU Nur di Rawang.

Menurut Pengarah Jabatan Penguatkuasaan dan Operasi Kawasan ST, Mohd Elmi Anas, programTouchpoint yang dijalankan di serata Semenanjung Malaysia dan Sabah menitikberatkan keselamatan elektrik di premis isi rumah berkategori B40 dan premis berisiko seperti sekolah agama dan rumah kebajikan. Tujuan program Touchpoint adalah bagi meringankan beban kewangan pengendali premis dengan menjalankan kerja-kerja pembaikan dan pemasangan. "Kami memperuntukkan RM100,000 setiap tahun bagi tujuan ini. Matlamat utama kami adalah untuk mencegah kemalangan elektrik di samping menjaga keselamatan penghuni."

Beliau turut menyatakan, "Kami telah memilih Pusat Jagaan Titian OKU Nur berasaskan keutamaan ini. Kami telah memeriksa dan membaiki sistem pendawaian di premis tersebut. Kami juga telah menasihati pengendali dan pekerja di situ mengenai kepentingan menggunakan kelengkapan dan peralatan elektrik yang cekap tenaga dan selamat."

Upgrading Electrical Wiring System in a Home for the Differently Abled in Rawang

In July 2019, the Commission inspected the electrical wiring system at Pusat Jagaan Titian OKU Nur in Rawang.

According to the Commission's Director of Enforcement and Regional Operations, Mohd Elmi Anas, Touchpoint programmes carried out in different parts of Peninsular Malaysia and Sabah target the electrical safety of premises belonging to B40 households and high-risk premises such as religious schools and welfare homes. The aim of the Touchpoint programme is also to ease the financial burden of the operators of these premises by carrying out repairs or installations. "Every year, we allocate RM100,000 for this purpose. Our priority is to prevent electrical accidents, and to safeguard the safety of the occupants."

He added, "We selected Pusat Jagaan Titian OKU Nur with this priority in mind. We inspected the premises and repaired the wiring system here. We also advised the operator and staff on the importance of using safe and energy efficient electrical appliances and equipment."

COMMUNITY OUTREACH INITIATIVES

EE Run 2019

Pada Ogos, ST telah menganjurkan *Energy Efficiency Run* atau lebih dikenali sebagai EE Run 2019. Acara ini telah mendapat penyertaan lebih daripada 1,400 peserta pelbagai usia, termasuk kakitangan ST serta ahli keluarga masing-masing, pelari berpengalaman dari sektor-sektor awam dan swasta, pelajar sekolah menengah dan penuntut institut pengajian tinggi dan warga Putrajaya serta persekitarannya.

Diadakan dua tahun sekali, EE Run dilancarkan pada tahun 2011 dengan tujuan mewujudkan kesedaran tentang penggunaan tenaga secara cekap di samping menggalakkan gaya hidup yang sihat. EE Run 2019 merupakan acara kelima yang telah dianjurkan oleh ST. Acara tersebut telah disempurnakan oleh Ketua Setiausaha Kementerian, Datuk Seri Dr. Mohd Azhar Yahaya, dan Pengerusi ST, Datuk Ir. Ahmad Fauzi Hasan.

Acara ini terdiri daripada larian 5km dan 10km bagi 12 kategori peserta. Kategori-kategori tersebut adalah:

- **Larian 5-km (8 kategori):** Lelaki Junior, Wanita Junior, Pelajar Lelaki, Pelajar Wanita, Lelaki Terbuka, Wanita Terbuka, Lelaki Veteran dan Wanita Veteran
- **Larian 10-km (4 kategori):** Lelaki Terbuka, Wanita Terbuka, Lelaki Veteran dan Wanita Veteran

Setiap peserta yang menamatkan larian masing-masing menerima *finisher medal* dan sijil penyertaan, manakala pemenang tempat pertama hingga kesepuluh bagi setiap kategori turut menerima hadiah wang tunai. Pemenang tempat pertama, kedua dan ketiga menerima piala di samping hadiah-hadiah yang lain.

Selain acara larian, terdapat juga pameran, aktiviti permainan dan kuiz mengenai kecekapan tenaga bagi menghiburkan para pengunjung di samping memberi pendedahan tentang penggunaan tenaga secara cekap dan selamat.

EE Run 2019

In August, the Commission held the Energy Efficiency Run, better known as the EE Run 2019. The event attracted more than 1,400 participants of all ages, including the Commission's staff and their families, experienced runners from the public and private sectors, high school and tertiary students and residents in and around Putrajaya.

Held once every two years, the EE Run was launched in 2011 with the objective of creating awareness of energy efficiency while promoting a healthy lifestyle. The EE Run 2019 is the fifth such an event hosted by the Commission. It was flagged off by the Secretary General of the Ministry, Datuk Seri Dr. Mohd Azhar Yahaya, and the Commission's Chairman, Datuk Ir Ahmad Fauzi Hasan.

The event consisted of a 5km race and a 10km race for 12 categories of participants. They are:

- **5-km race (8 categories):** Junior Boys, Junior Girls, School Boys, School Girls, Men's Open, Women's Open, Men's Veteran and Women's Veteran
- **10-km race (4 categories):** Men's Open, Women's Open, Men's Veteran and Women's Veteran

Participants who completed the race each received a finisher medal and certificate; the first to tenth place winners in each category received cash prizes as well. The first, second and third prize winners each received a trophy, in addition to the other prizes.

Besides running events, there were exhibitions, games and quizzes on energy efficiency to keep visitors entertained as well as educated on energy efficiency and safety.

INISIATIF MENDAMPINGI KOMUNITI

EE Run 2019

COMMUNITY OUTREACH INITIATIVES

EE Challenge 2019

Energy Efficiency Challenge atau lebih dikenali sebagai *EE Challenge*, adalah suatu pertandingan yang telah dilancarkan pada tahun 2014 untuk sekolah menengah bagi mencapai matlamat-matlamat berikut:

- Meningkatkan penggunaan tenaga secara cekap di kalangan generasi muda bagi memastikan penggunaan tenaga secara berhemah
- Memupuk budaya penjimatan penggunaan tenaga elektrik di kalangan para pelajar dan warga sekolah
- Mewujudkan kesedaran tentang impak kecekapan tenaga elektrik kepada alam sekitar

EE Challenge bermula dengan penyertaan tujuh buah sekolah menengah di Lembah Klang dan Putrajaya.

EE Challenge 2019

The Energy Efficienc Challenge also known as the EE Challenge, is a competition launched in 2014 for secondary schools to achieve the following goals:

- Promote energy efficiency among the younger generation to ensure the sustainable use of energy.
- Inculcate an electricity energy saving culture among students and in the school communities
- Create awareness of the impact of electricity energy efficiency efforts on the environment.

The EE Challenge began with the participation of seven secondary schools in the Klang Valley and Putrajaya.

Statistik Penyertaan, 2014-2019
Participation Statistics, 2014-2019

Tahun Year	Negeri State	Bil. Sekolah Nos. of Schools
2014	Putrajaya, Lembah Klang	7
2015	Putrajaya, Selangor, Melaka, Negeri Sembilan	29
2016	Semenanjung Malaysia	72
2017	Semenanjung Malaysia dan Sabah	72
2018	Semenanjung Malaysia dan Sabah	112
2019	Semenanjung Malaysia dan Sabah	106

Pada tahun 2019, terdapat 106 buah sekolah yang telah mengambil bahagian termasuk dua sekolah dari Sabah. Bilangan penyertaan yang tertinggi diterima dari Johor (19 buah sekolah). Secara keseluruhannya, seramai 85,937 orang pelajar dan 8,130 tenaga pengajar dan kakitangan telah menyertai acara ini.

EE Challenge 2019 telah menerima 84 penyertaan lengkap dari 116 buah sekolah yang menyertai pertandingan ini. Hasil pertandingan mendapati sebanyak 37 daripada 84 buah sekolah tersebut telah menunjukkan penjimatan tenaga elektrik sebanyak 397,438 kWj iaitu bersamaan dengan penjimatan bil elektrik sebanyak RM154,866.46.

Bagi kategori Video Paling Kreatif, ST telah menerima sebanyak 46 penyertaan; manakala 53 penyertaan telah diterima bagi kategori Video Paling Tular. Bilangan penyertaan dalam kategori-kategori ini mencerminkan trend kempen-kempen promosi dalam talian yang menyasarkan anak-anak muda. Kategori Video Paling Tular terus menjana tontonan walau pun telah tamat tempoh pertandingan ini.

Kategori Video Paling Tular dinilai berdasarkan sambutan video yang dimuat naik ke *Facebook, Youtube, Twitter* dan platform media sosial ST. Pemenang dipilih berdasarkan bilangan tontonan yang paling tinggi di antara 15 September ke 31 October 2019.

In 2019, there were 106 participating schools that included two schools from Sabah. The highest number of entries was received from Johor (19 schools). Altogether, 85,937 students and 8,130 faculty members and staff participated in the event.

EE Challenge 2019 received 84 completed submissions out of the 116 schools that entered the competition. The outcome from the competition found that 37 out of these 84 schools showed a reduction in electricity energy consumption amounting to 397,438 kWh, which is equivalent to RM154,866.46 saved in electricity bills.

For the Most Creative Video category, the Commission received 46 entries; there were 53 entries received for the Most Viral Video category. The number of entries in these categories reflects the trend for online promotional campaigns to influence youths. The Most Viral Video category continues to generate views even after the expiry of this competition.

The Most Viral Video category is judged by the number of responses to uploads on Facebook, Youtube, Twittter and the Commission's social media platform. Winners were chosen based on the highest number of views calculated between 15 September and 31 October 2019.

INISIATIF MENDAMPINGI KOMUNITI

Pemenang *EE Challenge* 2019
Winners of the EE Challenge 2019

Kategori: Kecekapan Tenaga Keseluruhan Category: Overall Energy Efficiency	
Pertama First	SMK Taman Nusa Damai, Johor
Kedua Second	SMK Kampung Baru Kerteh, Terengganu
Ketiga Third	SMK Medini, Johor
Kategori: Video Paling Kreatif Category: Most Creative Video	
Pertama First	SMK Paka, Terengganu
Kedua Second	SMK Dato' Syed Ahmad, Kedah
Ketiga Third	SMK Sultanah Bahiyah, Kedah
Kategori: Video Paling Tular Category: Most Viral Video	
Pertama First	SMK Paka, Terengganu
Kedua Second	SMK Kerteh, Terengganu
Ketiga Third	SMK Mutiara Rini, Johor

ALAM SEKITAR
ENVIRONMENT

Inisiatif *CSR Fabric REcycling*

ST adalah penyokong aktif inisiatif-inisiatif penyelamatan planet, terutamanya yang berkaitan dengan industri pembekalan elektrik dan gas berpaip. Sepanjang 2019, ST telah mengembangkan skop ini dalam usaha menjadikan budaya *Reduce, Reuse and Recycle (3R)* sebagai sebahagian daripada gaya hidup rakyat negara ini.

Selaras dengan matlamat itu, ST telah melancarkan *Fabric REcycling*, iaitu suatu inisiatif Tanggungjawab Sosial Korporat bagi menggalakkan orang awam untuk menghantar pakaian-pakaian yang tidak dipakai ke dalam tong kitar semula untuk dikumpul dan mengunakan semula. Inisiatif ini adalah bertujuan untuk mendidik rakyat Malaysia mengenai kepentingan mengitar semula bahan buangan seisi rumah bagi mengurangkan pencemaran.

Dua tong kitar semula telah disediakan; satu ditempatkan di Akademi Seni Budaya dan Warisan Kebangsaan atau ASWARA di Kuala Lumpur. Institusi pengajian tinggi tersebut merupakan antara yang pertama yang telah menerima tajaan tong kitar semula dari ST. Tong kitar semula kedua telah ditempatkan di ibu pejabat ST dan merupakan yang pertama seumpamanya di Putrajaya.

Fabric REcycling merupakan suatu kolaborasi di antara ST, ASWARA dan badan keusahawanan sosial Kloth Malaysia Sdn Bhd, yang bermatlamat untuk mengelakkan fabrik daripada dibuang di tapak pelupusan.

Fabric REcycling CSR Initiative

The Commission is an active proponent of save-the-planet initiatives, especially with regard to the electricity and piped gas supply industry. In 2019, it expanded this scope in its quest to make the Reduce, Reuse and Recycle (3R) culture a part of the national lifestyle.

In line with this, the Commission launched Fabric REcycling, a CSR initiative to encourage the public to deposit unwanted clothing in recycling bins, to be collected and repurposed. This initiative aims to educate the Malaysian public on the importance of recycling household waste to reduce pollution.

Two recycling bins were installed; one was placed at the Akademi Seni Budaya dan Warisan Kebangsaan or ASWARA that is based in Kuala Lumpur. This institute of higher learning is the first to have a recycling bin sponsored by the Commission. The second recycling bin is located at the Commission's head office and is the first of its kind in Putrajaya.

Fabric REcycling is a collaboration between the Commission, ASWARA and social enterprise Kloth Malaysia Sdn Bhd, whose goal is to keep fabrics out of landfills.

19 Mac 2019: Perasmian program *CSR Fabric REcycling* di ASWARA, Kuala Lumpur.

19 March 2019: The launch of the CSR Fabric REcycling programme at ASWARA, Kuala Lumpur.

Kitar semula menerusi program 'RE-cycling'

KUALA LUMPUR – Suruhanjaya Tenaga (ST) berjaya mengumpul lebih 80,000 kilogram (kg) fabrik untuk dikitar semula menerusi program tanggungjawab sosial korporat (CSR) yang dikenali 'Fabric RE-cycling'.

Pengarah Jabatan Perancangan Strategik dan Komunikasi ST, Kamarul Ariffin Ibrahim berkata, program itu penting dalam mendidik masyarakat mengenai cara betul mengitar semula pakaian terpakai untuk mengurangkan jumlah pembuangan sisa pepejal isi rumah, sekali gus membantu dalam mempelbagaikan sumber bahan api untuk penjanaan tenaga.

"Ia merupakan inisiatif kami yang mana fokus diberikan kepada aspek kelestarian tenaga, pemuliharaan alam sekitar dan kebajikan masyarakat.

"Kesemua fabrik yang berjaya dikumpul akan dibahagikan mengikut kategori, warna dan jenis kain bagi tujuan menentukan nilai fabrik," katanya ketika merasmikan program CSR di Akademi Seni Budaya dan Warisan Kebangsaan (Aswara) di sini semalam.

Turut hadir Dekan Fakulti Pengurusan Seni dan Budaya Aswara, Mejar (PA) Ts. Zulkifli Ab. Rashid.

Program CSR itu juga turut melibatkan kerjasama bersama Aswara dan Kloth Malaysia Sdn. Bhd. (Kloth Malaysia).

Dalam pada itu, Kamarul berkata, beberapa tong kitar semula akan ditempatkan di Ibu Pejabat ST di Putrajaya secara berperingkat selain di empat institusi pengajian tinggi yang akan diumumkan kemudian.

"Sebagai permulaan, Aswara dipilih sebagai institusi pengajian tinggi pertama yang menerima tajaan tong kitar semula daripada ST," ujarnya.

KAMARUL ARIFFIN (tiga dari kiri) bersama wakil Aswara dan Kloth Malaysia semasa melancarkan gimik perasmian program CSR 'Fabric RE-cycling' di Kuala Lumpur semalam.

PENYATA KEWANGAN

SIJIL KETUA AUDIT NEGARA
MENGENAI PENYATA KEWANGAN
SURUHANJAYA TENAGA
BAGI TAHUN BERAKHIR 31 DISEMBER 2019

Sijil Mengenai Pengauditan Penyata Kewangan

Pendapat

Penyata Kewangan Suruhanjaya Tenaga yang merangkumi Lembaran Imbangan pada 31 Disember 2019 dan Penyata Pendapatan, Penyata Perubahan Ekuiti serta Penyata Aliran Tunai bagi tahun berakhir pada tarikh tersebut, ringkasan polisi perakaunan yang signifikan dan nota kepada penyata kewangan seperti dinyatakan pada muka surat 5 hingga 20, telah diaudit oleh wakil saya.

Pada pendapat saya, penyata kewangan ini memberikan gambaran yang benar dan saksama mengenai kedudukan kewangan Suruhanjaya Tenaga pada 31 Disember 2019 dan prestasi kewangan serta aliran tunai bagi tahun berakhir pada tarikh tersebut selaras dengan Piawaian Pelaporan Entiti Persendirian Malaysia (MPERS) dan Akta Suruhanjaya Tenaga 2001 (Akta 610) dan Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta 1371).

Asas Kepada Pendapat

Pengauditan telah dilaksanakan berdasarkan Akta Audit 1957 dan *International Standards of Supreme Audit Institutions*. Tanggungjawab saya dihuraikan selanjutnya di perenggan Tanggungjawab Juruaudit Terhadap Pengauditan Penyata Kewangan dalam sijil ini. Saya percaya bahawa bukti audit yang diperoleh adalah mencukupi dan bersesuaian untuk dijadikan asas kepada pendapat saya.

Kebebasan dan Tanggungjawab Etika Lain

Saya adalah bebas daripada Suruhanjaya Tenaga dan telah memenuhi tanggungjawab etika lain berdasarkan *International Standards of Supreme Audit Institutions*.

Maklumat Lain Selain Daripada Penyata Kewangan dan Sijil Juruaudit Mengenainya

Anggota Suruhanjaya Tenaga bertanggungjawab terhadap maklumat lain dalam Laporan Tahunan. Pendapat saya terhadap Penyata Kewangan Suruhanjaya Tenaga tidak meliputi maklumat lain selain daripada Penyata Kewangan dan Sijil Juruaudit mengenainya dan saya tidak menyatakan sebarang bentuk kesimpulan jaminan mengenainya.

Tanggungjawab Anggota Suruhanjaya Tenaga Terhadap Penyata Kewangan

Anggota Suruhanjaya Tenaga bertanggungjawab terhadap penyediaan penyata kewangan Suruhanjaya Tenaga yang memberi gambaran benar dan saksama selaras dengan Piawaian Pelaporan Entiti Persendirian Malaysia (MPERS) dan Akta Suruhanjaya Tenaga 2001 (Akta 610) dan Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta 1371). Anggota Suruhanjaya Tenaga juga bertanggungjawab terhadap penetapan kawalan dalaman yang perlu bagi membolehkan penyediaan Penyata Kewangan Suruhanjaya Tenaga yang bebas daripada salah nyata yang ketara, sama ada disebabkan fraud atau kesilapan.

Semasa penyediaan Penyata Kewangan Suruhanjaya Tenaga, Anggota Suruhanjaya Tenaga bertanggungjawab untuk menilai keupayaan Suruhanjaya Tenaga untuk beroperasi sebagai satu usaha berterusan, mendedahkannya jika berkaitan serta menggunakannya sebagai asas perakaunan.

Tanggungjawab Juruaudit Terhadap Pengauditan Penyata Kewangan

Objektif saya adalah untuk memperoleh keyakinan yang munasabah sama ada Penyata Kewangan Suruhanjaya Tenaga secara keseluruhannya adalah bebas daripada salah nyata yang ketara, sama ada disebabkan fraud atau kesilapan, dan mengeluarkan Sijil Juruaudit yang merangkumi pendapat saya. Jaminan yang munasabah adalah satu tahap jaminan yang tinggi, tetapi bukan satu jaminan bahawa audit yang dijalankan mengikut *International Standards of Supreme Audit Institutions* akan sentiasa mengesan salah nyata yang ketara apabila ia wujud. Salah nyata boleh wujud daripada fraud atau kesilapan dan dianggap ketara sama ada secara individu atau agregat sekiranya boleh dijangkakan dengan munasabah untuk mempengaruhi keputusan ekonomi yang dibuat oleh pengguna berdasarkan penyata kewangan ini.

Sebagai sebahagian daripada pengauditan mengikut *International Standards of Supreme Audit Institutions*, saya menggunakan pertimbangan profesional dan mengekalkan keraguan profesional sepanjang pengauditan. Saya juga:

a. Mengenal pasti dan menilai risiko salah nyata ketara dalam penyata kewangan Suruhanjaya Tenaga, sama ada disebabkan fraud atau kesilapan, merangka dan melaksanakan prosedur audit yang responsif terhadap risiko berkenaan serta mendapatkan bukti audit yang mencukupi dan bersesuaian untuk memberikan asas kepada pendapat saya. Risiko untuk tidak mengesan salah nyata ketara akibat daripada fraud adalah lebih tinggi daripada kesilapan kerana fraud mungkin melibatkan pakatan, pemalsuan, ketinggalan yang disengajakan, representasi yang salah, atau mengatasi kawalan dalaman.

b. Memahami kawalan dalaman yang relevan untuk merangka prosedur audit yang bersesuaian tetapi bukan untuk menyatakan pendapat mengenai keberkesanan kawalan dalaman Suruhanjaya Tenaga.

c. Menilai kesesuaian dasar perakaunan yang diguna pakai kemunasabahan anggaran perakaunan dan pendedahan yang berkaitan oleh Anggota Suruhanjaya Tenaga.

d. Membuat kesimpulan terhadap kesesuaian penggunaan asas perakaunan untuk usaha berterusan oleh Anggota Suruhanjaya Tenaga dan berdasarkan bukti audit yang diperoleh, sama ada wujudnya ketidakpastian ketara yang berkaitan dengan peristiwa atau keadaan yang mungkin menimbulkan keraguan yang signifikan terhadap keupayaan Suruhanjaya Tenaga sebagai satu usaha berterusan. Jika saya membuat kesimpulan bahawa ketidakpastian ketara wujud, saya perlu melaporkan dalam Sijil Juruaudit terhadap pendedahan yang berkaitan dalam Penyata Kewangan Suruhanjaya Tenaga atau, jika pendedahan tersebut tidak mencukupi, pendapat saya akan diubah. Kesimpulan saya dibuat berdasarkan bukti audit yang diperoleh sehingga tarikh Sijil Juruaudit.

e. Menilai sama ada keseluruhan persembahan termasuk pendedahan Penyata Kewangan Suruhanjaya Tenaga memberi gambaran yang saksama.

Hal-hal Lain

Sijil ini dibuat untuk Anggota Suruhanjaya Tenaga berdasarkan Akta Suruhanjaya Tenaga 2001 (Akta 610) dan Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta 1371) dan bukan untuk tujuan lain. Saya tidak bertanggungjawab terhadap pihak lain bagi kandungan sijil ini.

(SWAIBATUL ASLAMIAH BINTI HAJI HUSAIN)
b.p. KETUA AUDIT NEGARA
MALAYSIA

PUTRAJAYA
4 OGOS 2020

PENYATA PENGERUSI DAN SEORANG ANGGOTA SURUHANJAYA TENAGA

Kami, Dato' Azian bin Osman dan Dato' Ir. Dr. Shaik Hussein bin Mydin yang merupakan Pengerusi dan salah seorang Anggota Suruhanjaya Tenaga, dengan ini menyatakan bahawa, pada pendapat Anggota Suruhanjaya Tenaga, Penyata Kewangan yang mengandungi Lembaran Imbangan, Penyata Pendapatan, Penyata Perubahan Ekuiti dan Penyata Aliran Tunai yang berikut ini berserta dengan nota-nota kepada Penyata Kewangan di dalamnya, adalah disediakan untuk menunjukkan pandangan yang benar dan saksama berkenaan kedudukan Suruhanjaya Tenaga pada 31 Disember 2019 dan hasil kendaliannya serta perubahan kedudukan kewangannya bagi tahun berakhir pada tarikh tersebut.

Bagi pihak Anggota,

.....

Dato' Azian bin Osman
Pengerusi

Tarikh: 26 Ogos 2020

Tempat: Suruhanjaya Tenaga
Presint 2, Putrajaya

Bagi pihak Anggota,

.....

Dato' Ir. Dr. Shaik Hussein bin Mydin
Anggota

Tarikh: 26 Ogos 2020

Tempat: Suruhanjaya Tenaga
Presint 2, Putrajaya

PENGAKUAN OLEH PEGAWAI UTAMA YANG BERTANGGUNGJAWAB KE ATAS PENGURUSAN KEWANGAN SURUHANJAYA TENAGA

Saya Abdul Razib bin Dawood, Ketua Pegawai Eksekutif yang bertanggungjawab ke atas pengurusan kewangan dan rekod-rekod perakaunan Suruhanjaya Tenaga dengan ikhlasnya mengakui bahawa Lembaran Imbangan, Penyata Pendapatan, Penyata Perubahan Ekuiti dan Penyata Aliran Tunai dalam kedudukan kewangan yang berikut ini beserta nota-nota kepada Penyata Kewangan di dalamnya mengikut sebaik-baik pengetahuan dan kepercayaan saya, adalah betul dan saya membuat ikrar ini dengan sebenarnya mempercayai bahawa ia adalah benar dan atas kehendak-kehendak Akta Akuan Berkanun, 1960.

Sebenarnya dan sesungguhnya)
diakui oleh penama di atas)
di BANDAR BARU BANGI SELANGOR)
pada 26 AUG 2020)

.....

Di hadapan saya,

PESURUHJAYA SUMPAH
B521
ZAIDAH BINTI MUHAMMAD
1.10.2018 - 31.12.2020
MALAYSIA

.....

PESURUHJAYA SUMPAH

No. 35-1 Jalan 7/7C, Seksyen 7
43650 Bandar Baru Bangi
Selangor

PENYATA KEWANGAN
FINANCIAL STATEMENTS

LEMBARAN IMBANGAN
Pada 31 Disember 2019

	Nota	2019 RM	2018 RM
Aset Tetap			
Hartanah, Kelengkapan dan Peralatan	4	**80,788,479**	82,303,164
Aset Semasa			
Tunai dan Kesetaraan Tunai	5	**117,935,916**	122,373,490
Pelaburan Jangka Pendek		**340,196,087**	289,754,219
Pelbagai Penghutang	6	**682,542**	684,093
Pendapatan Faedah Belum Terima	7	**5,425,199**	3,819,822
		464,239,744	416,631,624
Liabiliti Semasa			
Pemiutang Lain dan Tanggungan Terakru	8	**11,726,594**	10,189,134
Peruntukan Manfaat Pekerja Jangka Pendek	9	**2,917,578**	1,949,728
Kumpulan Wang Khas	10	**6,357,303**	6,484,436
Peruntukan Cukai		**4,341,377**	3,877,390
		25,342,852	22,500,688
Aset Bersih Semasa		**438,896,892**	394,130,936
		519,685,371	**476,434,100**
Dibiayai oleh :-			
Dana Terkumpul		**506,637,313**	468,269,548
Liabiliti Bukan Semasa			
Peruntukan Manfaat Pekerja Jangka Panjang	9	**13,048,058**	8,164,552
		519,685,371	**476,434,100**

Nota-nota yang disertakan dari muka surat 5 hingga 15 adalah sebahagian daripada Penyata Kewangan ini.

PENYATA KEWANGAN
FINANCIAL STATEMENTS

PENYATA PENDAPATAN
Bagi Tahun Berakhir 31 Disember 2019

	Nota	2019 RM	2018 RM
Pendapatan			
Yuran dan Caj	11	**109,519,354**	109,706,643
Faedah		**15,613,506**	13,957,832
Pelbagai		**1,511,741**	2,556,036
		126,644,601	126,220,511
Perbelanjaan			
Kos Kakitangan	12	**(60,479,930)**	(47,714,250)
Kos Pentadbiran	13	**(19,351,812)**	(20,027,817)
Susutnilai Hartanah, Kelengkapan dan Peralatan		**(3,288,370)**	(3,709,430)
Pelbagai Kos Operasi		**(858,142)**	(336,864)
		(83,978,254)	(71,788,361)
Lebihan Pendapatan Sebelum Cukai		**42,666,347**	54,432,150
Cukai	14	**(4,341,377)**	(3,845,215)
Lebihan Pendapatan Bersih Semasa		**38,324,970**	50,586,935

Nota-nota yang disertakan dari muka surat 5 hingga 15 adalah sebahagian daripada Penyata Kewangan ini.

PENYATA PERUBAHAN EKUITI
Bagi Tahun Berakhir 31 Disember 2019

	Nota	2019 RM	2018 RM
Dana Terkumpul			
Pada 1 Januari		**468,269,548**	417,557,432
Pelarasan Tahun Sebelum		**42,795**	125,181
Pendapatan		**126,644,601**	126,220,511
		594,956,944	543,903,124
Perbelanjaan		**(83,978,254)**	(71,788,361)
Cukai Tahun Semasa		**(4,341,377)**	(3,845,215)
Baki pada 31 Disember		**506,637,313**	468,269,548

Nota-nota yang disertakan dari muka surat 5 hingga 15 adalah sebahagian daripada Penyata Kewangan ini.

PENYATA KEWANGAN
FINANCIAL STATEMENTS

PENYATA ALIRAN TUNAI
Bagi Tahun Berakhir 31 Disember 2019

	Nota	2019 RM	2018 RM
ALIRAN TUNAI DARIPADA AKTIVITI OPERASI			
Lebihan pendapatan sebelum cukai		**42,666,347**	54,432,150
Pelarasan untuk perkara yang tidak melibatkan dana:			
Pelarasan penyata dana terkumpul		**42,795**	125,181
Pendapatan faedah diterima		**(15,613,506)**	(13,957,832)
Susutnilai hartanah, kelengkapan dan peralatan		**3,288,370**	3,709,430
Pelupusan hartanah, kelengkapan dan peralatan		**577**	1
Peruntukan manfaat pekerja		**8,080,860**	2,844,766
Keuntungan operasi sebelum perubahan dalam modal kerja		**38,465,443**	47,153,696
Perubahan dalam modal kerja:			
Peningkatan di dalam pelbagai penghutang dan faedah belum terima		**(1,603,826)**	(908,647)
Peningkatan di dalam pemiutang lain dan tanggungan terakru		**1,537,460**	656,083
Tunai dijana daripada aktiviti operasi		**38,399,077**	46,901,132
Bayaran cukai		**(3,877,390)**	(3,204,056)
Bayaran manfaat pekerja		**(2,229,504)**	(1,834,659)
Aliran tunai bersih dijana daripada aktiviti operasi		**32,292,183**	**41,862,417**
ALIRAN TUNAI DARIPADA AKTIVITI PELABURAN			
Pelaburan jangka pendek		**(50,441,868)**	22,583,606
Pembelian hartanah, kelengkapan dan peralatan		**(1,774,262)**	(1,380,100)
Pendapatan faedah diterima		**15,613,506**	13,957,832
Aliran tunai bersih daripada/(digunakan untuk) aktiviti pelaburan		**(36,602,624)**	**35,161,338**
ALIRAN TUNAI DARIPADA AKTIVITI KUMPULAN WANG KHAS			
Pemberian Kerajaan/Agensi kepada Kumpulan Wang Khas		**-**	-
Faedah bank Kumpulan Wang Khas		**64,148**	95,273
Pindahan semula dana		**(152,030)**	(6,876,802)
Perbelanjaan Kumpulan Wang Khas		**(39,251)**	(3,001,305)
Aliran tunai bersih digunakan untuk aktiviti kumpulan wang khas		**(127,133)**	**(9,782,834)**
Penambahan/(Penurunan) bersih dalam tunai kesetaraan tunai		**(4,437,574)**	**67,240,921**
Tunai dan kesetaraan tunai pada awal tahun		**122,373,490**	**55,132,569**
Tunai dan kesetaraan tunai pada akhir tahun	5	**117,935,916**	**122,373,490**

Nota-nota yang disertakan dari muka surat 5 hingga 15 adalah sebahagian daripada Penyata Kewangan ini.

NOTA-NOTA KEPADA PENYATA KEWANGAN

1. KEGIATAN UTAMA

Suruhanjaya Tenaga adalah sebuah badan berkanun yang beroperasi di No.12, Jalan Tun Hussein, Presint 2, 62100 Putrajaya.

Suruhanjaya Tenaga merupakan agensi pengawal selia tunggal bagi pengawalseliaan dan pembangunan sektor tenaga. Suruhanjaya Tenaga mempunyai tanggungjawab langsung bagi menyelia dan mengawasi kegiatan penjanaan tenaga termasuk mengawal selia setiap individu yang berlesen bawah Akta Suruhanjaya Tenaga, 2001.

Penyata Kewangan ini telah diluluskan dan diperakukan oleh Suruhanjaya Tenaga untuk ditandatangan pada 26 Ogos 2020.

2. ASAS PERAKAUNAN

Penyata kewangan Suruhanjaya Tenaga yang disediakan adalah mematuhi *Malaysian Private Entities Reporting Standards (MPERS)* yang diluluskan oleh Lembaga Piawaian Perakaunan Malaysia (MASB). Penyata kewangan telah disediakan berasaskan konvensyen kos sejarah dan amalan perakaunan yang diterima umum di Malaysia.

Penyediaan Penyata Kewangan mengikut MPERS memerlukan pengurusan untuk membuat pertimbangan, anggaran dan andaian yang mempengaruhi pemakaian polisi perakaunan dan laporan amaun aset, liabiliti, pendapatan dan perbelanjaan. Walaupun pertimbangan, anggaran dan andaian adalah berdasarkan kepada pengetahuan dan tindakan semasa pihak pengurusan yang terbaik, keputusan sebenar mungkin berbeza. Anggaran dan andaian disemak atas dasar berterusan. Semakan anggaran perakaunan diiktiraf dalam tempoh di mana anggaran disemak dan dalam mana-mana tempoh hadapan yang berkenaan.

3. POLISI PERAKAUNAN

(a) Hartanah, Kelengkapan dan Peralatan

Hartanah, Kelengkapan dan Peralatan dinyatakan pada kos ditolak susutnilai terkumpul dan rosot nilai, jika ada. Kerja dalam kemajuan tidak disusutnilaikan.

Susutnilai bagi hartanah, kelengkapan dan peralatan dikira berdasarkan kaedah asas garis lurus ke atas anggaran jangka masa guna aset berkenaan.

Kadar tahunan susutnilai adalah seperti berikut:

Bangunan	2%
Kenderaan bermotor	20%
Perabot, kelengkapan, ubah suai dan peralatan penguatkuasaan	20%
Peralatan pejabat (elektronik)	15%
Sistem aplikasi dan komputer	33 1/3%
Lekapan dan kelengkapan	20%

Tanah pada nilai kos adalah jenis pegangan untuk selama-lamanya dan tidak disusutnilaikan.

Nilai sisa, jangka hayat dan kaedah susutnilai dikaji semula pada setiap akhir tahun kewangan bagi memastikan amaunnya, kaedah dan tahun susutnilai adalah selaras dengan anggaran sebelumnya serta corak penggunaan manfaat ekonomi hartanah dan peralatan tersebut.

(b) Tunai dan Kesetaraan Tunai

Tunai dan Kesetaraan Tunai merangkumi tunai di tangan dan baki bank, deposit di bank dan institusi kewangan lain serta pelaburan berjangka pendek yang mempunyai kecairan tinggi dengan tempoh matang 3 bulan dan kurang dari tarikh pembelian dan sedia ditukar dalam bentuk tunai dengan risiko perubahan nilai yang rendah.

Penyata Aliran Tunai disediakan menggunakan kaedah secara tidak langsung.

(c) Pelaburan Jangka Pendek

Pelaburan Jangka Pendek merupakan deposit di bank dan institusi kewangan lain serta pelaburan berjangka pendek yang mempunyai kecairan tinggi dengan tempoh matang lebih 3 bulan dan sehingga setahun dari tarikh pembelian dan sedia ditukar dalam bentuk tunai dengan risiko perubahan nilai yang rendah.

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NOTA-NOTA KEPADA PENYATA KEWANGAN

3. POLISI PERAKAUNAN (SAMBUNGAN)

(d) Pelbagai Penghutang

Pelbagai Penghutang dinyatakan pada kos dan ditolak dengan peruntukan hutang ragu, jika ada.

(e) Pemiutang Lain

Pemiutang lain dinyatakan pada nilai saksama bayaran yang perlu dibayar untuk barangan dan perkhidmatan yang telah diterima.

(f) Kumpulan Wang Khas

Kumpulan Wang Khas merupakan peruntukan khas yang diterima daripada Akaun Amanah Industri Bekalan Elektrik (AAIBE) di bawah Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA) yang mana kini dikendalikan oleh Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC) dan Agensi Kerajaan bagi tujuan-tujuan yang khusus.

(g) Rosot Nilai

Nilai bawaan bagi aset-aset Suruhanjaya Tenaga dan aset kewangan disemak semula pada setiap tarikh Lembaran Imbangan untuk menentukan sama ada terdapat sebarang petunjuk adanya rosot nilai. Jika petunjuk tersebut wujud, nilai perolehan semula akan dianggarkan. Kerugian rosot nilai akan diiktiraf dalam penyata pendapatan melainkan jika nilai bawaan aset tersebut telah dinilaikan semula, di mana ianya dikenakan ke rizab. Kerugian rosot nilai diiktiraf apabila nilai gunaan bagi aset atau aset yang dipunyai oleh unit penghasilan tunai melebihi nilai penampungnya.

Amaun yang boleh diperolehi adalah nilai yang lebih besar antara harga jualan bersih harta tersebut dan nilai gunaannya. Dalam menentukan nilai gunaan, anggaran nilai tunai masa depan akan didiskaunkan kepada nilai terkini menggunakan kadar diskaun sebelum cukai yang menunjukkan penilaian pasaran semasa terhadap nilai masa tunai dan risiko-risiko khusus atas harta tersebut. Bagi aset yang tidak menghasilkan sebahagian besar aliran tunainya secara tersendiri, amaun yang boleh diperolehi ditentukan untuk aset yang dipunyai oleh unit penghasilan tunai untuk aset berkenaan.

Bagi aset-aset yang lain, kerugian rosot nilai akan diambil kira semula apabila terdapat perubahan dalam anggaran yang digunakan untuk menentukan amaun yang boleh diperolehi.

Kerugian rosot nilai hanya akan dikira semula ke tahap nilai bawaan aset tersebut tidak melebihi nilai bawaan asal, setelah ditolak susutnilai, seolah-olah kerugian rosot nilai tidak pernah dikenakan. Kira semula tersebut akan dikenakan ke Penyata Pendapatan, melainkan jika kira semula tersebut dikenakan kepada aset yang dinilaikan semula, ianya akan dikenakan ke ekuiti.

(h) Percukaian

Cukai pendapatan ke atas untung atau rugi bagi tahun berkenaan ialah cukai semasa. Cukai semasa ialah amaun cukai pendapatan dijangka yang perlu dibayar atas untung boleh cukai bagi tahun berkenaan dan diukur dengan menggunakan kadar cukai yang digunakan pada tarikh Lembaran Imbangan.

Perbelanjaan cukai semasa adalah bayaran cukai yang dijangkakan ke atas pendapatan yang boleh dikenakan cukai bagi tahun semasa, dengan menggunakan kadar cukai yang diwartakan atau sebahagian besarnya diwartakan pada tarikh Lembaran Imbangan, dan sebarang perubahan pada bayaran cukai untuk tahun terdahulu.

Cukai tertunda diperuntukkan dengan menggunakan kaedah tanggungan untuk semua perbezaan masa terhasil di antara kadar cukai aset dan tanggungan dan nilai di bawa dalam penyata kewangan. Perbezaan bersifat sementara tidak diiktiraf bagi muhibah, yang tidak dibenarkan bagi tujuan percukaian, dan pada permulaan pengiktirafan aset atau tanggungan dimana pada masa transaksi ianya tidak mempengaruhi keuntungan berkanun dan keuntungan yang boleh dikenakan cukai. Jumlah cukai tertunda yang diperuntukkan adalah berdasarkan kepada jangkaan cara realisasi atau penyelesaian bagi nilai di bawa aset dan tanggungan, menggunakan kadar cukai diwartakan atau sebahagian besarnya diwartakan pada tarikh Lembaran Imbangan.

Aset cukai tertunda diiktiraf hanya pada mana ianya berkemungkinan keuntungan yang boleh dikenakan cukai di masa hadapan boleh diperolehi dari aset yang digunakan.

NOTA-NOTA KEPADA PENYATA KEWANGAN

3. POLISI PERAKAUNAN (SAMBUNGAN)

(i) Manfaat Pekerja

i) Manfaat Pekerja Jangka Pendek

Upah, gaji dan bonus diiktiraf sebagai perbelanjaan dalam tahun di mana perkhidmatan dilaksanakan oleh pekerja-pekerja Suruhanjaya Tenaga. Cuti berganjaran terkumpul jangka pendek seperti cuti tahunan berbayar diiktiraf apabila perkhidmatan dilaksanakan oleh pekerja yang akan meningkatkan kelayakan pekerja ke atas cuti berbayar hadapan, dan cuti berganjaran jangka pendek tidak terkumpul seperti cuti sakit hanya diiktiraf apabila cuti berlaku. Kemudahan perubatan seperti kemudahan rawatan pesakit luar, kemudahan skim hospital dan pembedahan berkumpulan dan kemudahan bersalin adalah diberikan kepada semua kakitangan tetap dan kontrak berdasarkan peruntukan yang telah ditetapkan di dalam Terma dan Syarat Perkhidmatan Suruhanjaya Tenaga yang sedang berkuat kuasa. Manakala, manfaat pekerja seperti pemberian faedah persaraan berbentuk gratuiti dan subsidi bagi pinjaman perumahan, kenderaan dan peribadi yang akan dibayar dalam tahun kewangan akan datang akan diiktiraf secara akruan di dalam Penyata Pendapatan tahun semasa sebagai perbelanjaan dan di dalam Lembaran Imbangan sebagai Liabiliti Semasa.

ii) Pelan Sumbangan Tetap

Mengikut undang-undang, majikan di Malaysia yang berkelayakan diwajibkan memberi sumbangan tetap ke atas Kumpulan Wang Simpanan Pekerja dan PERKESO. Sumbangan tersebut diiktiraf sebagai perbelanjaan di dalam Penyata Pendapatan. Tanggungan untuk pelan sumbangan tetap, diiktiraf sebagai perbelanjaan semasa di dalam Penyata Pendapatan.

iii) Manfaat Pekerja Jangka Panjang

Manfaat Pekerja Jangka Panjang ialah pemberian faedah persaraan berbentuk gratuiti kepada kakitangan kakitangan tetap yang telah berkhidmat minimum 10 tahun dengan kadar pengiraan gratuiti seperti yang diluluskan oleh YB Menteri. Ianya merupakan bayaran manfaat pekerja yang dibayar selepas bersara yang diiktiraf secara akruan dalam Penyata Pendapatan tahun semasa sebagai perbelanjaan dan di dalam Lembaran Imbangan sebagai Liabiliti Bukan Semasa. Pengiktirafan dengan menggunakan *actuarial valuation method*.

(j) Pengiktirafan Pendapatan dan Perbelanjaan

Pendapatan dari yuran dan caj diambil kira mengikut asas tunai memandangkan tanggungjawab pembayaran tahunan adalah pada pemegang-pemegang lesen. Selain itu, pendapatan faedah bagi simpanan semasa di bank dikira berasaskan tunai manakala pendapatan faedah daripada simpanan tetap dan pelaburan jangka pendek serta semua perbelanjaan diambil kira mengikut asas akruan. Pendapatan pelbagai terdiri daripada jualan dokumen tender, jualan buku-buku berkaitan industri, jualan aset tetap dan caj/penalti yang dikenakan atas kegagalan melaksanakan projek. Pelbagai kos operasi merangkumi perbelanjaan sumbangan atau penajaan yang dibuat oleh Suruhanjaya Tenaga untuk penyelidikan dan pembangunan.

(k) Pendedahan Pihak Berkaitan

Pihak-pihak yang dianggap berkaitan jika satu pihak mempunyai keupayaan untuk mengawal pihak lain atau melaksanakan pengaruh ke atas pihak lain, setakat mana ia menghalang pihak lain dari mengejar kepentingan sendiri yang berasingan dalam membuat keputusan kewangan dan operasi.

(l) Peruntukan

Peruntukan diiktiraf apabila Suruhanjaya Tenaga mempunyai obligasi semasa yang konstruktif dan dari segi undang-undang, kesan daripada peristiwa lalu dan berkemungkinan bahawa aliran keluar sumber yang melibatkan manfaat ekonomi akan diperlukan untuk menyelesaikan obligasi tersebut dan amaun obligasi itu boleh dianggarkan dengan pasti.

Peruntukan disemak pada setiap tarikh pelaporan dan diselaraskan untuk membayangkan anggaran semasa terbaik. Jika tiada lagi kemungkinan bahawa aliran keluar sumber ekonomi akan diperlukan untuk menyelesaikan obligasi itu, peruntukan tersebut akan dibalikkan. Sekiranya kesan nilai masa wang adalah ketara, peruntukan akan didiskaunkan menggunakan kadar sebelum cukai semasa yang menggambarkan, bila mana bersesuaian, risiko khusus kepada liabiliti tersebut. Apabila pendiskaunan digunakan, peningkatan dalam peruntukan yang disebabkan oleh peredaran masa diiktiraf sebagai kos kewangan.

4. HARTANAH, KELENGKAPAN DAN PERALATAN

2019	Tanah	Bangunan	Kenderaan Bermotor	Perabot, Kelengkapan, Ubahsuai dan Peralatan Penguatkuasaan	Peralatan Pejabat (Elektronik)	Sistem Aplikasi dan Komputer	Lekapan dan Kelengkapan	Jumlah
	RM	RM	RM	RM	RM	RM	RM	RM
Kos								
Pada 1 Januari 2019	**8,299,405**	**79,205,160**	**3,967,265**	**6,192,721**	**5,155,761**	**5,135,488**	**1,530,134**	**109,485,934**
Penambahan	**-**	**-**	**534,237**	**763,004**	**143,779**	**283,236**	**50,006**	**1,774,262**
Pelupusan/Pindahan	**-**	**-**	**(153,604)**	**(17,603)**	**(50,758)**	**(4,565)**	**-**	**(226,530)**
Pada 31 Disember 2019	**8,299,405**	**79,205,160**	**4,347,898**	**6,938,122**	**5,248,782**	**5,414,159**	**1,580,140**	**111,033,666**
Susutnilai Terkumpul								
Pada 1 Januari 2019	**-**	**8,712,567**	**3,627,962**	**5,336,796**	**4,028,008**	**3,947,363**	**1,530,074**	**27,182,770**
Susutnilai Tahun Semasa	**-**	**1,584,103**	**214,785**	**305,634**	**619,720**	**562,578**	**1,550**	**3,288,370**
Pelupusan/Pindahan	**-**	**-**	**(153,603)**	**(17,603)**	**(50,183)**	**(4,564)**	**-**	**(225,953)**
Pada 31 Disember 2019	**-**	**10,296,670**	**3,689,144**	**5,624,827**	**4,597,545**	**4,505,377**	**1,531,624**	**30,245,187**
Nilai Buku Bersih								
Pada 31 Disember 2019	**8,299,405**	**68,908,490**	**658,754**	**1,313,295**	**651,237**	**908,782**	**48,516**	**80,788,479**

4. HARTANAH, KELENGKAPAN DAN PERALATAN (SAMBUNGAN)

2018	Tanah	Bangunan	Kenderaan Bermotor	Perabot, Kelengkapan, Ubahsuai dan Peralatan Penguatkuasaan	Peralatan Pejabat (Elektronik)	Sistem Aplikasi dan Komputer	Lekapan dan Kelengkapan	Jumlah
	RM	RM	RM	RM	RM	RM	RM	RM
Kos								
Pada 1 Januari 2018	8,299,405	79,205,160	3,803,688	5,982,334	5,014,851	4,274,160	1,530,134	108,109,732
Penambahan	-	-	163,577	210,387	140,910	865,226	-	1,380,100
Pelupusan/Pindahan	-	-	-	-	-	(3,898)	-	(3,898)
Pada 31 Disember 2018	8,299,405	79,205,160	3,967,265	6,192,721	5,155,761	5,135,488	1,530,134	109,485,934
Susutnilai Terkumpul								
Pada 1 Januari 2018	-	7,128,464	3,285,182	4,661,960	3,430,030	3,594,478	1,377,123	23,477,237
Susutnilai Tahun Semasa	-	1,584,103	342,780	674,836	597,978	356,782	152,951	3,709,430
Pelupusan/Pindahan	-	-	-	-	-	(3,897)	-	(3,897)
Pada 31 Disember 2018	-	8,712,567	3,627,962	5,336,796	4,028,008	3,947,363	1,530,074	27,182,770
Nilai Buku Bersih								
Pada 31 Disember 2018	**8,299,405**	**70,492,593**	**339,303**	**855,925**	**1,127,753**	**1,188,125**	**60**	**82,303,164**

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NOTA-NOTA KEPADA PENYATA KEWANGAN

5. TUNAI DAN KESETARAAN TUNAI

	2019	2018
	RM	RM
Wang Tunai dan Baki di Bank	**38,226,099**	48,595,635
Deposit di Bank Berlesen	**79,709,817**	73,777,855
JUMLAH	**117,935,916**	**122,373,490**

Wang Tunai dan Baki di Bank adalah termasuk dana Kumpulan Wang Khas sebanyak RM6,357,303 (2018: RM6,484,436).

6. PELBAGAI PENGHUTANG

	2019	2018
	RM	RM
Pendahuluan Kakitangan	**6,620**	10,323
Deposit Keahlian Kelab	**92,000**	92,000
Lain- lain deposit dan Penghutang	**583,922**	581,770
JUMLAH	**682,542**	**684,093**

7. PENDAPATAN FAEDAH BELUM TERIMA

	2019	2018
	RM	RM
Hasil Faedah Terakru	**5,425,199**	3,819,822
	5,425,199	**3,819,822**

Pendapatan Faedah Belum Terima adalah faedah belum matang bagi simpanan tetap yang diambil kira sehingga 31 Disember setiap tahun.

8. PEMIUTANG LAIN DAN TANGGUNGAN TERAKRU

	2019	2018
	RM	RM
Pemiutang Lain	**9,893,566**	8,857,851
Peruntukan Cuti Kakitangan (GCR)	**1,785,540**	1,290,975
Yuran Audit	**47,488**	40,308
JUMLAH	**11,726,594**	**10,189,134**

NOTA-NOTA KEPADA PENYATA KEWANGAN

9. PERUNTUKAN MANFAAT PEKERJA

	2019	2018
	RM	RM
Pada 1 Januari	**10,114,280**	9,104,173
Peruntukan bagi Tahun Semasa	**8,080,860**	2,844,766
Bayaran pada Tahun Semasa	**(2,229,504)**	(1,834,659)
Pada 31 Disember	**15,965,636**	**10,114,280**

Struktur kematangan Peruntukan Manfaat Pekerja adalah seperti berikut:

	2019	2018
	RM	RM
Matang dalam Tempoh 12 Bulan	**2,917,578**	1,949,728
Matang dalam Tempoh Melebihi 12 bulan	**13,048,058**	8,164,552
JUMLAH	**15,965,636**	**10,114,280**

Peningkatan Peruntukan Manfaat Pekerja dalam tahun 2019 adalah selaras dengan penambahan kakitangan dan pindaan Terma dan Syarat Perkhidmatan Suruhanjaya Tenaga yang berkuat kuasa pada 1 Mac 2019.

10. KUMPULAN WANG KHAS

2019	Akaun Wang Khas PPKTL	Akaun Wang Khas MyPower	Akaun Wang Khas PR&PLL	Akaun Wang Khas SAIDI 100	Jumlah
	RM	RM	RM	RM	RM
Baki pada 1 Januari 2019	**721,891**	**1,817**	**5,595,228**	**165,500**	**6,484,436**
Pendapatan:					
Pemberian Kerajaan/ Agensi	**-**	**-**	**-**	**-**	**-**
Faedah Bank	**7,276**	**163**	**55,888**	**822**	**64,149**
	7,276	**163**	**55,888**	**822**	**64,149**
(-) Perbelanjaan					
Caj bank	**-**	**(1)**	**-**	**-**	**(1)**
Perbelanjaan/Pelunasan dalam tahun	**-**	**-**	**(39,251)**	**-**	**(39,251)**
Pindahan Semula Peruntukan/Dana	**-**	**-**	**-**	**(152,030)**	**(152,030)**
	-	**(1)**	**(39,251)**	**(152,030)**	**(191,282)**
Lebihan/(Kurangan) Pendapatan	**7,276**	**162**	**16,637**	**(151,208)**	**(127,133)**
Baki pada 31 Disember 2019	**729,167**	**1,979**	**5,611,865**	**14,292**	**6,357,303**

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NOTA-NOTA KEPADA PENYATA KEWANGAN

10. KUMPULAN WANG KHAS (SAMBUNGAN)

2018	Akaun Wang Khas PPKTL	Akaun Wang Khas MyPower	Akaun Wang Khas PR&PLL	Akaun Wang Khas SAIDI 100	Jumlah
	RM	RM	RM	RM	RM
Baki pada 1 Januari 2018	**1,190,147**	**8,588,717**	**5,941,269**	**547,137**	**16,267,270**
Pendapatan:					
Pemberian Kerajaan/ Agensi	-	-	-	-	**-**
Faedah Bank	9,311	25,566	56,650	3,809	**95,336**
	9,311	25,566	56,650	3,809	**95,336**
(-) Perbelanjaan					
Caj bank	(13)	(28)	(11)	(11)	**(63)**
Perbelanjaan/Pelunasan dalam tahun	(477,554)	(1,735,636)	(402,680)	(385,435)	**(3,001,305)**
Pindahan Semula Peruntukan/Dana	-	(6,876,802)	-	-	**(6,876,802)**
	(477,567)	(8,612,466)	(402,691)	(385,446)	**(9,878,170)**
Kurangan Pendapatan	(468,256)	(8,586,900)	(346,041)	(381,637)	**(9,782,834)**
Baki pada 31 Disember 2018	**721,891**	**1,817**	**5,595,228**	**165,500**	**6,484,436**

Kumpulan Wang Khas merupakan peruntukan khas yang diterima daripada Akaun Amanah Industri Bekalan Elektrik (AAIBE) di bawah Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA) yang mana kini dikendalikan oleh Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC) serta Agensi Kerajaan bagi tujuan-tujuan yang khusus. Butiran setiap akaun di bawah Kumpulan Wang Khas adalah seperti berikut:-

i) **Akaun Wang Khas PPKTL:** bertujuan membiayai Projek Pelan Komunikasi Tenaga Lestari bagi mempromosi tenaga lestari yang merangkumi bidang kecekapan tenaga dan tenaga boleh baharu, serta memupuk kesedaran dan meningkatkan pengetahuan orang ramai terhadap kerangka perundangan dan kawal selia tenaga lestari.

ii) **Akaun Wang Khas MyPower:** bertujuan membiayai pelaksanaan inisiatif bagi projek di bawah RMKe-10 iaitu *Stabilisation Mechanism, Ring Fencing Single Buyer, Fuel Supply and Security dan Industry Structure*.

iii) **Akaun Wang Khas PR & PLL:** bagi membiayai Projek Retrofit dan Pemasangan Lampu LED di bangunan kementerian terpilih yang mula dilaksanakan pada awal tahun 2015.

iv) **Akaun Wang Khas SAIDI 100:** bertujuan untuk mengkaji dan mengenal pasti isu-isu berkaitan bekalan elektrik di negeri Sabah bagi mencapai sasaran kerajaan untuk menurunkan tahap Sistem Purata Tempoh Gangguan (SAIDI) bekalan elektrik kepada pengguna menjelang tahun 2020. Pemulangan dana sebanyak RM152,030 telah dibuat oleh Suruhanjaya Tenaga kepada tabung AAIBE Sabah pada 2 Mei 2019 seperti yang diarahkan oleh Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC) melalui surat bertarikh 7 Mac 2019. Baki sebanyak RM14,292 adalah merupakan hibah terkumpul sehingga 31 Disember 2019.

11. YURAN DAN CAJ

	2019	2018
	RM	RM
Pelesenan Awam dan Persendirian	**76,946,220**	78,723,800
Pendaftaran/ Pembaharuan Fi Operasi	**31,504,080**	29,804,290
Lain-lain Fi Operasi	**1,069,054**	1,178,553
	109,519,354	**109,706,643**

NOTA-NOTA KEPADA PENYATA KEWANGAN

12. KOS KAKITANGAN

	2019	2018
	RM	RM
Gaji, Elaun dan Faedah Kewangan Yang Lain	**51,116,766**	39,624,706
Sumbangan Berkanun	**6,446,481**	5,441,923
Kos Perjalanan dan Sara Hidup	**2,399,320**	2,248,266
Elaun Anggota Suruhanjaya Tenaga	**517,363**	399,355
	60,479,930	**47,714,250**

Pada tahun 2019, Suruhanjaya Tenaga telah melaksanakan pelarasan gaji untuk semua kakitangan serta pindaan Terma dan Syarat Perkhidmatan Suruhanjaya Tenaga yang melibatkan penambahbaikan kemudahan kakitangan yang berkuatkuasa pada 1 Mac 2019. Termasuk di dalam Sumbangan Berkanun adalah sumbangan kepada Kumpulan Wang Simpanan Pekerja (KWSP) berjumlah RM6,176,464 (2018: RM5,183,653) dan sumbangan kepada PERKESO RM270,017 (2018: RM258,270). Bilangan kakitangan Suruhanjaya Tenaga pada 31 Disember 2019 adalah seramai 340 orang. Manakala, bilangan kakitangan untuk tahun 2018 adalah seramai 328 orang.

13. KOS PENTADBIRAN

Kos pentadbiran adalah seperti berikut:-

	2019	2018
	RM	RM
Perkhidmatan Ikhtisas:		
Fi Audit	**53,820**	40,308
Fi Profesional dan Konsultan	**4,284,167**	5,854,457
Pembangunan Kompetensi dan Pengurusan Prestasi	**816,191**	798,790
Perbelanjaan-perbelanjaan Lain Pekhidmatan Ikhtisas	**1,080,381**	803,489
Penyenggaraan:		
Penyenggaraan Sistem Aplikasi	**4,761,715**	4,447,404
Penyenggaraan Alatan, Kenderaan dan Bangunan Pejabat	**1,737,175**	1,831,356
Sewaan Bangunan Pejabat, Kenderaan dan Peralatan	**2,579,010**	2,817,479
Hospitaliti, Perhubungan dan Utiliti	**2,808,601**	2,686,240
Percetakan dan Bekalan Pejabat	**1,230,752**	748,294
	19,351,812	**20,027,817**

PENYATA KEWANGAN
FINANCIAL STATEMENTS

NOTA-NOTA KEPADA PENYATA KEWANGAN

14. CUKAI

	2019	2018
	RM	RM
Perbelanjaan Cukai		
Tahun Semasa	**4,341,377**	3,877,390
Lebihan/ Kurangan Peruntukan pada Tahun Terdahulu	**-**	(32,175)
Jumlah	**4,341,377**	**3,845,215**
Penyesuaian Kadar Cukai Efektif		
Lebihan Pendapatan Sebelum Cukai	**42,666,347**	54,432,150
Cukai pada Kadar 28%	**11,946,577**	15,241,002
Pendapatan yang Dikecualikan Cukai	**(7,605,200)**	(11,395,787)
	4,341,377	3,845,215
Lebihan/ Kurangan Peruntukan pada Tahun Terdahulu	**-**	-
Perbelanjaan Cukai	**4,341,377**	**3,845,215**

Suruhanjaya Tenaga telah mendapat pengecualian cukai pendapatan di bawah Seksyen 127(3)b Akta Cukai Pendapatan 1967 yang diberikan oleh Kementerian Kewangan pada 19 Oktober 2004. Pengecualian cukai tersebut diberikan hanya ke atas pendapatan berkanun yang berikut:

i. Pendapatan yang diterima daripada Kerajaan Persekutuan atau Kerajaan Negeri dalam bentuk suatu pemberian atau subsidi;
ii. Pendapatan yang diterima berkenaan dengan suatu amaun yang boleh dikenakan ke atas atau dipungut daripada mana-mana orang mengikut peruntukan Akta yang mengawal selia pihak berkuasa berkanun; dan
iii. Derma atau sumbangan yang diterima.

15. KOMITMEN

	2019	2018
	RM	RM
Hartanah, Kelengkapan dan Peralatan	**99,601**	629,823
Perkhidmatan Ikhtisas	**5,595,795**	1,594,133
Utiliti, Bekalan Pejabat dan Penyenggaraan	**1,008,712**	1,063,924
Sumbangan	**-**	500,000
Emolumen	**90,083**	4,295,720
	6,794,191	**8,083,600**

NOTA-NOTA KEPADA PENYATA KEWANGAN

15. KOMITMEN (SAMBUNGAN)

Komitmen bagi tahun berakhir 31 Disember 2019 di bawah Hartanah, Kelengkapan dan Peralatan berjumlah RM99,601 adalah merupakan baki kos ubah suai ruang pejabat di dalam bangunan Ibu Pejabat dan Pejabat Suruhanjaya Tenaga Negeri Pahang serta perolehan aset-aset lain termasuk kelengkapan perabot dan peralatan elektronik. Kos bagi mendapatkan perkhidmatan pakar runding dan konsultansi di bawah Perkhidmatan Ikhtisas adalah berjumlah RM5,595,795.

Komitmen untuk Penyenggaraan bagi menaik taraf sistem, menyenggara sistem rangkaian ICT, khidmat sokongan dan penyenggaraan bangunan adalah berjumlah RM852,481 manakala kos Utiliti berjumlah RM156,231. Jumlah Emolumen sebanyak RM90,083 adalah untuk menampung perbelanjaan berkaitan pindaan Terma dan Syarat Perkhidmatan Suruhanjaya Tenaga yang dikuatkuasakan bermula pada 1 Mac 2019.

Jumlah Komitmen bagi tahun 2018 sebanyak RM8,083,600 meliputi kos berkaitan Hartanah, Kelengkapan dan Peralatan, Perkhidmatan Ikhtisas, Penyenggaraan dan Bekalan Pejabat, Sumbangan bagi program KURSI Ekonomi Tenaga dan Emolumen.

16. LIABILITI LUAR JANGKA

Suatu tindakan sivil telah difailkan di Mahkamah Tinggi Shah Alam terhadap Suruhanjaya Tenaga (ST) oleh syarikat NMH Engineering Services Sdn Bhd (NMH) pada pada 26.12.2018 dan menuntut antara lainnya supaya ST menarik balik surat pembatalan Perakuan-Perakuan Pendaftaran yang dikeluarkan kepada 50 pemilik-pemilik pepasangan elektrik dan menuntut ganti rugi sebanyak RM9,857,475.43 termasuk faedah dan kos kepada ST. Tuntutan ini dibuat ekoran daripada keputusan ST untuk membatalkan Perakuan-Perakuan Pendaftaran syarikat tersebut.

Pada tahun 2019, suatu saman sivil telah difailkan di Mahkamah Tinggi Shah Alam terhadap Suruhanjaya Tenaga ("ST") oleh Syarikat NMH Engineering Sdn Bhd ("NMH") pada 16.10.2019 untuk deklarasi bahawa pembatalan perakuan-perakuan pendaftaran NMH oleh ST pada 18.01.2019 adalah tidak sah dan menuntut sebanyak RM1,290,000.00 bagi kerugian akibat pembatalan tersebut, ganti rugi am, faedah dan kos.

FINANCIAL STATEMENTS

CERTIFICATE OF THE AUDITOR GENERAL ON THE FINANCIAL STATEMENTS OF ENERGY COMMISSION FOR THE YEAR ENDED 31 DECEMBER 2019

Certificate on the Audit of the Financial Statements

Opinion

The Financial Statements of the Energy Commission which comprise the Statement of Financial Position as at 31 December 2019 and Statement of Comprehensive Income, Statement of Changes in Equity and Statement of Cash Flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, as set out on pages 5 to 19 have been audited by my representative.

In my opinion, the accompanying financial statements give a true and fair view of the financial position of the Energy Commission as at 31 December 2019, and of its financial performance and its cash flows for the year then ended in accordance with the Malaysian Private Entities Reporting Standard (MPERS) and Energy Commission Act 2001 (Act 610) and Energy Commission (Amendment) Act 2010 (Act A1371).

Basis for Opinion

The audit was conducted in accordance with the Audit Act 1957 and the International Standards of Supreme Audit Institutions. My responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of my certificate. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Independence and Other Ethical Responsibilities

I am independent of the Energy Commission and I have fulfilled our other ethical responsibilities in accordance with the International Standards of Supreme Audit Institutions.

Information Other than the Financial Statements and Auditor's Certificate Thereon

The Members of the Energy Commission are responsible for the other information in the Annual Report. My opinion on the Financial Statements of the Energy Commission does not cover other information than the Financial Statements and Auditor's Certificate thereon and I do not express any form of assurance conclusion thereon.

Responsibilities of the Members of the Energy Commission for the Financial Statements

The Members of the Energy Commission are responsible for the preparation of Financial Statements of the Energy Commission that give a true and fair view in accordance with Malaysian Private Entities Reporting Standard (MPERS) and Energy Commission Act 2001 (Act 610) and Energy Commission (Amendment) Act 2010 (Act A1371). The Members of the Energy Commission are also responsible for such internal control as it is necessary to enable the preparation of the Financial Statements of the Energy Commission that are free from material misstatement, whether due to fraud or error.

In preparing the Financial Statements of the Energy Commission, the Members of the Energy Commission are responsible for assessing the Energy Commission's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting.

Auditor's Responsibilities for the Audit of the Financial Statements

My objectives are to obtain reasonable assurance about whether the Financial Statements of the Energy Commission as a whole are free from material misstatement, whether due to fraud or error, and to issue Auditor's Certificate that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the International Standards of Supreme Audit Institutions will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with the International Standards of Supreme Audit Institutions, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

a. Identify and assess the risks of material misstatement of the Financial Statements of the Energy Commission, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

b. Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Energy Commission's internal control.

c. Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Members of the Energy Commission.

d. Conclude on the appropriateness the Members of the Energy Commission's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on of the Energy Commission's ability to continue as a going concern. If I conclude that a material uncertainty exists, I have to draw attention in my Auditor's Certificate to the related disclosures in the Financial Statements of the Energy Commission or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of Auditor's Certificate.

e. Evaluate the overall presentation of the Financial Statements of the Energy Commission, including the disclosures, and whether the Financial Statements of the Energy Commission represents the underlying transactions and events in a manner that achieves fair presentation.

Other Matters

This certificate is made solely to the Members of the Energy Commission in accordance with Energy Commission Act 2001 (Act 610) and Energy Commission (Amendment) Act 2010 (Act A1371) and for no other purpose. I do not assume responsibility to any other person for the content of this certificate.

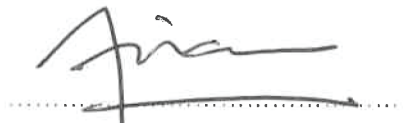
(SWAIBATUL ASLAMIAH BINTI HAJI HUSAIN)
ON BEHALF OF AUDITOR GENERAL
MALAYSIA

PUTRAJAYA
7th AUGUST 2020

STATEMENT BY CHAIRMAN AND A MEMBER OF THE ENERGY COMMISSION

We, Dato' Azian bin Osman and Dato' Ir. Dr. Shaik Hussein bin Mydin, being the Chairman and one of the Members of the Energy Commission, hereby declare, that in the opinion of the Energy Commission Members, the Financial Statements comprising the Statement of Financial Position, Statement of Comprehensive Income, Statement of Changes in Equity, Statement of Cash Flows and the notes on the Financial Statements have been prepared so as to give a true and fair view of the state of affairs of the Energy Commission as at 31 December 2019 and of its results and changes in the financial position for the year ended on that date.

On behalf of the Commission Members,



Dato' Azian bin Osman
Chairman

Date: 26 August 2020

Place: Energy Commission
Precinct 2, Putrajaya

On behalf of the Commission Members,

Dato' Ir. Dr. Shaik Hussein bin Mydin
Member

Date: 26 August 2020

Place: Energy Commission
Precinct 2, Putrajaya

DECLARATION OF OFFICER PRIMARILY RESPONSIBLE FOR THE FINANCIAL MANAGEMENT OF THE ENERGY COMMISSION

I, Abdul Razib bin Dawood, Chief Executive Officer, responsible for the financial management and accounting records of the Energy Commission, solemnly declare that the Statement of Financial Position, Statement of Comprehensive Income, Statement of Changes in Equity and the Statement of Cash Flows in the following financial position and the notes on the Financial Statements, are, to the best of my knowledge and belief, correct, and that I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declaration Act, 1960.

Subscribed and solemnly declared)

by the above-named)

at BANDAR BARU BANGI SELANGOR)

on 26 AUG 2020)

.....

Before me,

PESURUHJAYA SUMPAH

B521
ZAIDAH BINTI
MUHAMMAD
.10.2018 - 31.12.2020

.....

COMMISSIONER OF OATH
MALAYSIA

No. 35-1 Jalan 7/7C, Seksyen 7
43650 Bandar Baru Bangi
Selangor

PENYATA KEWANGAN
FINANCIAL STATEMENTS

STATEMENT OF FINANCIAL POSITION
As At 31 December 2019

	Note	2019 RM	2018 RM
Non-Current Assets			
Property, Fittings and Equipment	4	**80,788,479**	82,303,164
Current Assets			
Cash and Cash Equivalents	5	**117,935,916**	122,373,490
Short Term Investment		**340,196,087**	289,754,219
Other Receivables	6	**682,542**	684,093
Accrued Interest Income	7	**5,425,199**	3,819,822
		464,239,744	416,631,624
Current Liabilities			
Other Payables and Accruals	8	**11,726,594**	10,189,134
Provision for Short Term Employee Benefits	9	**2,917,578**	1,949,728
Special Funds	10	**6,357,303**	6,484,436
Tax Provisions		**4,341,377**	3,877,390
		25,342,852	22,500,688
Net Current Assets		**438,896,892**	394,130,936
		519,685,371	**476,434,100**
Financed by:			
Retained Profits		**506,637,313**	468,269,548
Non-Current Liabilities			
Provision for Long Term Employee Benefits	9	**13,048,058**	8,164,552
		519,685,371	**476,434,100**

The attached notes from pages 5 to 15 are an integral part of this Financial Statement.

PENYATA KEWANGAN
FINANCIAL STATEMENTS

STATEMENT OF COMPREHENSIVE INCOME
For The Year Ended 31 December 2019

	Note	2019 RM	2018 RM
Income			
Fees and Charges	11	**109,519,354**	109,706,643
Interests		**15,613,506**	13,957,832
Other Income		**1,511,741**	2,556,036
		126,644,601	126,220,511
Expenditure			
Staff Costs	12	**(60,479,930)**	(47,714,250)
Administrative Costs	13	**(19,351,812)**	(20,027,817)
Depreciation of Property, Fittings and Equipment		**(3,288,370)**	(3,709,430)
Other Operating Costs		**(858,142)**	(336,864)
		(83,978,254)	(71,788,361)
Profit Before Tax		**42,666,347**	54,432,150
Taxation Expense	14	**(4,341,377)**	(3,845,215)
Profit for The Year		**38,324,970**	50,586,935

The attached notes from pages 5 to 15 are an integral part of this Financial Statement.

STATEMENT OF CHANGES IN EQUITY
For The Year Ended 31 December 2019

	Note	2019 RM	2018 RM
Retained Profits			
Balance as at 1 January		**468,269,548**	417,557,432
Adjustment from previous year		**42,795**	125,181
Income		**126,644,601**	126,220,511
		594,956,944	543,903,124
Expenditure		**(83,978,254)**	(71,788,361)
Taxation		**(4,341,377)**	(3,845,215)
Balance as at 31 December		**506,637,313**	468,269,548

The attached notes from pages 5 to 15 are an integral part of this Financial Statement.

PENYATA KEWANGAN
FINANCIAL STATEMENTS

STATEMENT OF CASH FLOWS
For The Year Ended 31 December 2019

	Note	2019 RM	2018 RM
CASH FLOWS FROM OPERATING ACTIVITIES			
Surplus of income before tax		**42,666,347**	54,432,150
Adjustments for non-cash items:			
Accumulated funds statement		**42,795**	125,181
Income from interest received		**(15,613,506)**	(13,957,832)
Depreciation of property, fittings and equipment		**3,288,370**	3,709,430
Disposal of property, fittings and equipment		**577**	1
Provisions for employee benefits		**8,080,860**	2,844,766
Operating surplus before changes in working capital		**38,465,443**	47,153,696
Changes in working capital:			
Increase in other receivables and accrued interest income		**(1,603,826)**	(908,647)
Increase in other payables and accrued liabilities		**1,537,460**	656,083
Cash flows from operating activities		**38,399,077**	46,901,132
Tax payment		**(3,877,390)**	(3,204,056)
Payment for employee benefits		**(2,229,504)**	(1,834,659)
Net cash generated from operating activities		**32,292,183**	**41,862,417**
CASH FLOWS FROM INVESTING ACTIVITIES			
Short term investment		**(50,441,868)**	22,583,606
Purchase of property, fittings and equipment		**(1,774,262)**	(1,380,100)
Interest income received		**15,613,506**	13,957,832
Net cash (used in)/from investing activities		**(36,602,624)**	**35,161,338**
CASH FLOWS FROM SPECIAL FUNDS ACTIVITIES			
Fund allocation from Government/Agency to Special Funds		**-**	-
Bank interest from Special Funds		**64,148**	95,273
Special Funds transfer		**(152,030)**	(6,876,802)
Special Funds expenses		**(39,251)**	(3,001,305)
Net cash used in Special Funds activities		**(127,133)**	**(9,782,834)**
Net (decrease)/increase in cash and cash equivalents		**(4,437,574)**	**67,240,921**
Cash and cash equivalents at the beginning of the year		**122,373,490**	**55,132,569**
Cash and cash equivalents at the end of the year	5	**117,935,916**	**122,373,490**

The attached notes from pages 5 to 15 are an integral part of this Financial Statement.

NOTES ON THE FINANCIAL STATEMENTS

1. PRINCIPAL ACTIVITIES

The Energy Commission is a statutory body operating at No. 12, Jalan Tun Hussein, Presint 2, 62100 Putrajaya.

The Energy Commission is the sole regulatory agency for the energy sector's regulation and development. Under the Energy Commission Act 2001, the Energy Commission is directly responsible to supervise and monitor the energy generation activities, including regulating each licensed individuals.

The Financial Statements were approved and certified for signature by the Energy Commission on 26 August 2020.

2. ACCOUNTING POLICIES

The Energy Commission's Financial Statements were prepared in compliance with the Malaysia Private Entities Reporting Standards (MPERS) approved by the Malaysian Accounting Standards Board (MASB) and based on the historical cost convention and generally accepted accounting practices in Malaysia.

The preparation of the Financial Statements in accordance to MPERS requires the management to make judgments, estimates and assumptions that affect the application of accounting policies and reports of the amounts of assets, liabilities, income and expenses. Although judgements, estimates and assumptions are based on the best management knowledge and actions during the management, actual results may vary. Estimates and assumptions are reviewed on a continuous basis. A revised accounting estimates is recognized in the period in which the estimates is revised and in any relevant future period.

3. ACCOUNTING POLICIES

(a) Property, Fittings and Equipment

Property, Fittings and Equipment are stated at cost less accumulated depreciation and impairment, if any. Work in progress are not depreciated.

Depreciation for property, fittings and equipment are calculated based on the straight line method over the estimated useful life span of the assets.

The annual depreciation rates are as follows:

Buildings	2%
Motor vehicles	20%
Furniture, equipment, renovations and enforcement instrumentation	20%
Office equipment (electronics)	15%
Application systems and computers	33 1/3%
Fixtures and equipment	20%

Freehold land is measured at cost and not depreciated.

The residual value, useful lives and rate of depreciation are reviewed at the end of each financial year to ensure that the amounts, methods and year of depreciation are in line with previous estimates and expected economic benefits of utilising the property and equipment.

(b) Cash and Cash Equivalents

Cash and Cash Equivalents consists of cash in hand and bank balances, deposits in banks and other financial institutions, and also high liquidity short term investments with a maturity period of three (3) months or less from the date of purchase and can be readily redeemed in the form of cash and with low risks of value flunctuations.

The Cash Flow Statements are prepared using the indirect method.

(c) Short Term Investments

Short Term Investments are deposits in bank and other financial institutions, and also short term investments with high liquidity with maturity periods of three (3) months or up to a year from the date of purchase and which can be readily redeemed in the form of cash with low risks of value fluctuation.

PENYATA KEWANGAN
FINANCIAL STATEMENTS

NOTES ON THE FINANCIAL STATEMENTS

3. ACCOUNTING POLICIES (CONTINUED)

(d) Other Receivables

Other Receivables are stated at cost less provisions for bad debts, if any.

(e) Other Payables

Payment for goods and services are payable at the stated fair value.

(f) Special Funds

Special Funds are provisions received from the Electricity Supply Industry Trust Fund (AAIBE) under the Ministry of Energy, Green Technology and Water (KeTTHA), which is currently administered by the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC), and Government agencies for specific purposes.

(g) Impairment

The carrying value of the Commission's assets and financial assets are reviewed at each date of the balance sheet to determine whether there have been indications of impairment. If any such indication exists, the recoverable amount will be estimated. An impairment loss will be recognised in the income statement except when the carrying value of the asset has been re-valued and charged to reserves. An impairment loss is recognised whenever the value in use for the asset or assets owned by the income generating unit exceeds its recoverable amount.

Recoverable amount is the higher difference between the asset's net selling price and value in use. In assessing value in use, which is measured by reference to the discounted future cash flow using pre-tax discount rate that reflects the current market assessment of the cash value and risks on the asset. For an asset that does not generate large cash flows by itself, the recoverable amout is determined by the cash-generating unit to which it belongs.

For other assets, an impairment loss is reversed when there has been a change in the estimates used to determine recoverable amount.

The impairment loss is reversed to the extent of the carrying amount of the asset that would have been determined (net of depreciation) had no impairment loss been recognised. A reversal of an impairment loss is credited to the income statement but in the case of reversal on a revalued asset, it is credited to equity.

(h) Taxation

Current tax is the taxation charged on the income surplus or deficit for the year. Current tax is the expected amount payable on taxable income for the year and is measured using rates applicable on the date of the Balance Sheet.

Current tax expenses are the expected tax payable on the taxable income for the year, using tax rates gazetted or substantially gazetted at the balance sheet date, and any adjustments to tax payable in respect of the previous year.

Provisions for deferred tax is made, by the liability method, for all timing differences between tax rates of assets and liabilities and their carrying amount in the financial statements. Temporary differences are not recognised for goodwill, is not deductible for taxation purposes, and the initial recognition of an asset or liability at the time of the transaction does not affect the statutory income surplus and taxable income surplus. The total provision for deferred tax is based on the expected manner of realisation or settlement of the carrying amount of the assets and liabilities, using tax rates gazetted or substantially gazetted on the date of the balance sheet.

Deferred tax assets are recognised only when it is probable that taxable income surplus can be derived in the future from the assets used.

NOTES ON THE FINANCIAL STATEMENTS

3. ACCOUNTING POLICIES (CONTINUED)

(i) Employee Benefits

i) Short Term Employee Benefits

Wages, salaries and bonuses are recognised as expenses in the current year services performed by employees of the Energy Commission. Short term accumulated compensations such as paid annual leave are recognised when employees render services that increase their entitlement for paid leave in the future, and short term non-accumulative compensations such as paid sick leave are only recognised when such leave of absence occur. Medical facilities such as outpatient treatment facilities, hospitalisation scheme and group surgery facilities and maternity facilities are provided to all permanent and contract personnel based on the provisions set out in the terms and conditions of the Energy Commission's service in force. Meanwhile, employee benefits such as gratuity and subsidised pension benefits for mortgages, vehicles and personal loans payable in the next financial year will be recognised on an accrual basis in the current Statement of Income as an expense and in the Balance Sheet as Current Liabilities.

ii) Compulsory Contribution Plan

The law requires qualified Malaysian employers to make compulsory contributions to the Employees Provident Fund and Social Security Organisation (SOCSO). The contributions are recognised as expenses in the income statement. Liabilities for the compulsory contribution plans are recognised as current expenses in the income statement.

iii) Long-Term Employee Benefits

Long-Term Employee Benefits are the provision of retirement benefits in the form of gratuities to the permanent staff serving for a minimum of ten years with the gratuity calculation rate as per approved by the YB Minister. It is considered as an employee's benefit payment; paid upon retirement and is recognised as expenses and is stipulated as Non-Current Liabilities in the Balance Sheet. Recognition is by the use of actuarial valuation methods

(j) Recognition of Income and Expenditure

Income from fees and charges are accounted for on a cash basis as the annual payment obligation is on the licensees. In addition, interest income from fixed deposits and short-term investments as well as all expenses are accounted for on an accrual basis. Other income consists of sales of tender documents, sales of industry-related books, fixed asset sales and charges/penalties imposed on failure to execute projects. Other operating costs include entertainment expenses in relation to the Energy Commission's official affairs by authorised officers as well as contributions or sponsorships made for researches and developments.

(k) Related Party Disclosures

The parties deemed to be related if one party has the ability to control the other party or exercise influence over another party, to the extent that it prevents others from pursuing separate personal interests in making financial and operating decisions.

(l) Provisions

Provisions are recognized when the Energy Commission has a legal current and constructive obligation, the effects of past events and a possible outflow of resources involving economic benefits is required to settle the obligation, and the amount of the obligation can be estimated with certainty.

Provisions are reviewed at each reporting date and adjusted to reflect the best current estimate. If there is no possibility that an outflow of economic resources will be required to settle the obligation, the provision will be reversed. If the effect of time value of money is significant, the provision will be discounted using the current pre-tax rate which reflects, where appropriate, the risks specific to the liability. Whenever discounting is used, the increase in provisions caused by time-pass is recognized as a finance cost.

4. PROPERTY, FITTINGS AND EQUIPMENT

2019	Land	Building	Motor Vehicle	Furniture, Fittings, Renovations and Enforcement Equipment	Office Equipment (Electronic)	Application Systems and Computer	Fixtures and Equipment	Total
	RM	RM	RM	RM	RM	RM	RM	RM
Cost								
At 1 January 2019	8,299,405	79,205,160	3,967,265	6,192,721	5,155,761	5,135,488	1,530,134	109,485,934
Addition	-	-	534,237	763,004	143,779	283,236	50,006	1,774,262
Disposal/Transfer	-	-	(153,604)	(17,603)	(50,758)	(4,565)	-	(226,530)
At 31 December 2019	8,299,405	79,205,160	4,347,898	6,938,122	5,248,782	5,414,159	1,580,140	111,033,666
Accumulated Depreciation								
At 1 January 2019	-	8,712,567	3,627,962	5,336,796	4,028,008	3,947,363	1,530,074	27,182,770
Charge for the Year	-	1,584,103	214,785	305,634	619,720	562,578	1,550	3,288,370
Disposal/Transfer	-	-	(153,603)	(17,603)	(50,183)	(4,564)	-	(225,953)
At 31 December 2019	-	10,296,670	3,689,144	5,624,827	4,597,545	4,505,377	1,531,624	30,245,187
Net Book Value								
At 31 December 2019	**8,299,405**	**68,908,490**	**658,754**	**1,313,295**	**651,237**	**908,782**	**48,516**	**80,788,479**

4. PROPERTY, FITTINGS AND EQUIPMENT

2018	Land	Building	Motor Vehicle	Furniture, Fittings, Renovations and Enforcement Equipment	Office Equipment (Electronic)	Application Systems and Computer	Fixtures and Equipment	Total
	RM	RM	RM	RM	RM	RM	RM	RM
Cost								
At 1 January 2018	8,299,405	79,205,160	3,803,688	5,982,334	5,014,851	4,274,160	1,530,134	108,109,732
Addition	-	-	163,577	210,387	140,910	865,226	-	1,380,100
Disposal/Transfer	-	-	-	-	-	(3,898)	-	(3,898)
At 31 December 2018	8,299,405	79,205,160	3,967,265	6,192,721	5,155,761	5,135,488	1,530,134	109,485,934
Accumulated Depreciation								
At 1 January 2018	-	7,128,464	3,285,182	4,661,960	3,430,030	3,594,478	1,377,123	23,477,237
Charge for the Year	-	1,584,103	342,780	674,836	597,978	356,782	152,951	3,709,430
Disposal/Transfer	-	-	-	-	-	(3,897)	-	(3,897)
At 31 December 2018	-	8,712,567	3,627,962	5,336,796	4,028,008	3,947,363	1,530,074	27,182,770
Net Book Value								
At 31 December 2018	**8,299,405**	**70,492,593**	**339,303**	**855,925**	**1,127,753**	**1,188,125**	**60**	**82,303,164**

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NOTES ON THE FINANCIAL STATEMENTS

5. CASH AND CASH EQUIVALENTS

	2019	2018
	RM	RM
Cash and Bank Balances	**38,226,099**	48,595,635
Deposits in Licensed Banks	**79,709,817**	73,777,855
TOTAL	**117,935,916**	**122,373,490**

Cash and Bank Balance includes the Special Fund of RM6,357,303 (2018: RM6,484,436).

6. OTHER RECEIVABLES

	2019	2018
	RM	RM
Staff Advance	**6,620**	10,323
Club Membership Deposits	**92,000**	92,000
Other Deposits and Receivables	**583,922**	581,770
TOTAL	**682,542**	**684,093**

7. ACCRUED INTEREST INCOME

	2019	2018
	RM	RM
Accrued Interest Income	**5,425,199**	3,819,822
	5,425,199	**3,819,822**

Accrued Interest Income is the immature benefit of fixed deposits which is accounted for as at 31 December each year.

8. OTHER PAYABLES AND ACCRUALS

	2019	2018
	RM	RM
Other Payables	**9,893,566**	8,857,851
Provisions of Staff Leave (GCR)	**1,785,540**	1,290,975
Audit Fees	**47,488**	40,308
TOTAL	**11,726,594**	**10,189,134**

NOTES ON THE FINANCIAL STATEMENTS

9. PROVISION FOR EMPLOYEE BENEFITS

	2019	2018
	RM	RM
At 1 January	**10,114,280**	9,104,173
Current Year Provision	**8,080,860**	2,844,766
Current Year Payments	**(2,229,504)**	(1,834,659)
At 31 December	**15,965,636**	**10,114,280**

The maturity structure for Provisions for Employess Benefits are as follows:-

	2019	2018
	RM	RM
Maturity within 12 months	**2,917,578**	1,949,728
Maturity exceeding 12 months	**13,048,058**	8,164,552
TOTAL	**15,965,636**	**10,114,280**

Increase in Provision for Employee Benefits for the year 2019 is in line with the increase in number of personnel and implementation of amendments to the Energy Commission's Terms and Conditions of Service effective 1 March 2019.

10. SPECIAL FUNDS

2019	PPKTL Special Funds Account	MyPower Special Funds Account	PR&PLL Special Funds Account	SAIDI 100 Special Funds Account	Total
	RM	RM	RM	RM	RM
Balance as at 1 January 2019	**721,891**	**1,817**	**5,595,228**	**165,500**	**6,484,436**
Income:					
Fund allocation from Government/ Agencies	**-**	**-**	**-**	**-**	**-**
Bank interest	**7,276**	**163**	**55,888**	**822**	**64,149**
	7,276	**163**	**55,888**	**822**	**64,149**
(-) Expenditure					
Bank charges	**-**	**(1)**	**-**	**-**	**(1)**
Expenses/Repayment for the year	**-**	**-**	**(39,251)**	**-**	**(39,251)**
Transfer of provisions/funds	**-**	**-**	**-**	**(152,030)**	**(152,030)**
	-	**(1)**	**(39,251)**	**(152,030)**	**(191,282)**
Surplus/ (Deficit) of income	**7,276**	**162**	**16,637**	**(151,208)**	**(127,133)**
Balance as at 31 December 2019	**729,167**	**1,979**	**5,611,865**	**14,292**	**6,357,303**

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10. SPECIAL FUNDS (CONTINUED)

2018	PPKTL Special Funds Account	MyPower Special Funds Account	PR&PLL Special Funds Account	SAIDI 100 Special Funds Account	Total
	RM	RM	RM	RM	RM
Balance as at 1 January 2018	**1,190,147**	**8,588,717**	**5,941,269**	**547,137**	**16,267,270**
Income:					
Fund allocation from Government/ Agencies	-	-	-	-	**-**
Bank interest	9,311	25,566	56,650	3,809	**95,336**
	9,311	25,566	56,650	3,809	**95,336**
(-) Expenditure					
Bank charges	(13)	(28)	(11)	(11)	**(63)**
Expenses/Repayment for the year	(477,554)	(1,735,636)	(402,680)	(385,435)	**(3,001,305)**
Transfer of provisions/funds	-	(6,876,802)	-	-	**(6,876,802)**
	(477,567)	(8,612,466)	(402,691)	(385,446)	**(9,878,170)**
Deficit of income	(468,256)	(8,586,900)	(346,041)	(381,637)	**(9,782,834)**
Balance as at 31 December 2018	**721,891**	**1,817**	**5,595,228**	**165,500**	**6,484,436**

Special Funds are special allocations received from the Electricity Supply Industry Trust Fund (ESITF) under the Ministry of Energy, Green Technology and Water (KeTTHA), which is currently administered by the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) and Government agencies for specific purposes. Details of each account under the Special Funds are as follows:-

i) **PPKTL Special Funds Account:** to finance Sustainable Energy Communications Plan Project that aims to promote the use of sustainable energy encompassing the field of energy efficiency and renewable energy, and to foster greater awareness and enhance the public's knowledge on the legal framework and regulations related to sustainable energy.

ii) **MyPower Special Funds Account:** to finance the implementation of project initiatives under the 10th Malaysia Plan namely the Stabilisation Mechanism, Ring Fencing Single Buyer, Fuel Supply and Security and Industry Structure.

iii) **PR & PLL Special Funds Account:** to finance retrofitting projects and installation of LED lighting in selected ministry buildings beginning in early 2015.

iv) **SAIDI 100 Special Funds Account:** to review and identify on eletrical issues in Sabah in reaching the target to lower the System Average Interruption Duration Index (SAIDI) of the electrical power utilities towards 2020. A sum of RM152,030 was transfered by the Energy Commission to the AAIBE Sabah fund on 2 May 2019 as instructed by the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) through a letter dated 7 March 2019. The remaining amount of RM14,292 is the total hibah received until 31 December 2019.

11. FEES AND CHARGES

	2019	2018
	RM	RM
Public and Private Licenses	**76,946,220**	78,723,800
Registration/Operations Renewal Fees	**31,504,080**	29,804,290
Other Operating Fees	**1,069,054**	1,178,553
	109,519,354	**109,706,643**

NOTES ON THE FINANCIAL STATEMENTS

12. STAFF COSTS

	2019	2018
	RM	RM
Wages, Allowances and other Financial Benefits	**51,116,766**	39,624,706
Statutory Contributions	**6,446,481**	5,441,923
Travelling and Subsistence Allowances	**2,399,320**	2,248,266
Energy Commission Members' Allowances	**517,363**	399,355
	60,479,930	**47,714,250**

In 2019, the Energy Commission has implemented salary adjustments for all employees as well as amendments to the Energy Commission's Terms and Conditions of Service of which includes enhancement on the staff benefits effective 1 March 2019. Included in the Statutory Contributions is the contribution made to the Employees Provident Fund (EPF) amounting to RM6,176,464 (2018: RM5,183,653) and contributions to SOCSO amounting RM270,017 (2018: RM258,270). The total number of Energy Commission's employees as at 31 December 2019 stands at 340 personnel. Meanwhile the total number of employees in 2018 was 328 personnel.

13. ADMINISTRATION COSTS

The administration costs are as follows:-

	2019	2018
	RM	RM
Professional Services:		
Audit Fees	**53,820**	40,308
Professional and Consultancy Fees	**4,284,167**	5,854,457
Development Cost of Competency and Management Performance	**816,191**	798,790
Other Professional Services Expenses	**1,080,381**	803,489
Maintenance:		
Application System Maintenance	**4,761,715**	4,447,404
Equipment, Vehicle and Office Building Maintenance	**1,737,175**	1,831,356
Rental of Office Building, Vehicle and Equipment	**2,579,010**	2,817,479
Hospitality, Communications and Utilities	**2,808,601**	2,686,240
Printing and Office Supplies	**1,230,752**	748,294
	19,351,812	**20,027,817**

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14. TAXATION EXPENSE

	2019	2018
	RM	RM
Tax Expenses		
Current year	**4,341,377**	3,877,390
Surplus/Deficit of provision from previous year	**-**	(32,175)
Total	**4,341,377**	**3,845,215**
Reconciliation of effective tax rates		
Surplus income before tax	**42,666,347**	54,432,150
Tax at 28%	**11,946,577**	15,241,002
Tax-exempted income	**(7,605,200)**	(11,395,787)
	4,341,377	3,845,215
Surplus/Deficit of Provisions from Previous Year	**-**	-
Tax Expenses	**4,341,377**	**3,845,215**

The Energy Commission is tax-exempted under Section 127(3)b Income Tax Act 1967 which was conferred by the Ministry of Finance on 19 October 2004. The tax exemption is applicable only to statutory income as follows:

i. Income received from the Federal or State Govenment in the form of grants or subsidies;
ii. Income received in connection with any amount chargeable or collectible from any person according to the provisions of the Act which regulates statutory authorities; and
iii. Contributions and donations received.

15. COMMITMENTS

	2019	2018
	RM	RM
Property, Fittings and Equipments	**99,601**	629,823
Professional Services	**5,595,795**	1,594,133
Maintenance and Office Supplies	**1,008,712**	1,063,924
Contribution	**-**	500,000
Emolument	**90,083**	4,295,720
	6,794,191	**8,083,600**

NOTES ON THE FINANCIAL STATEMENTS

15. COMMITMENTS (CONTINUED)

Included in the Commitments for the year ended 31 December 2019 under Property, Fittings and Equipments amounting to RM99,601 are the remaining renovation costs for Energy Commissions' head office and office in Pahang, and assets procured including fittings and electronic equipments. The cost in acquiring professional services and consultancy under Professional Services are amounting to RM5,595,795.

Maintenance costs for system upgrade, ICT network maintenance, operational support and building maintenances, and utilities are amounting to RM852,481 and RM156,231 respectively. Emolument cost of RM90,083 is the costs related to the amendments to the Energy Commission's Terms and Conditions which was effective on 1 March 2019.

The Commitment costs for the year 2018 amounting to RM8,083,600 consists of costs related to Property, Fittings and Equipments, Professional Services, Maintenance and Office Supplies, Contribution for *'KURSI Ekonomi Tenaga',* and Emolument.

16. CONTINGENT LIABILITY

A civil action was filed by NMH Engineering Services Sdn Bhd (NMH) on 26.12.2018 at the Shah Alam High Court to Energy Commission to withdraw the cancellation on Certificates of Registration which was issued to 50 electrical installation owners and has made a claim on damages to the Energy Commission amounted RM9,857,475.43 which includes interests and costs. The claim on damages was made due to Energy Commission's decision to cancel NMH's Certificates of Registration.

In 2019, a civil suit was filed by NMH at the Shah Alam High Court against ST on 16.10.2019 for a declaration that ST's decision of 18.01.2019 to cancel NMH's certificates of registration was null and void and to claim RM 1,290,000.00 for losses arising from the cancellation, general damages, interest and costs.

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