

# LAPORAN TAHUNAN

ANNUAL REPORT  
2022



**Mengutamakan  
Keselamatan  
dan Penguatkuasaan**  
*Prioritising Safety and Enforcement*







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**DICETAK DI MALAYSIA**



# MENGUTAMAKAN KESELAMATAN DAN PENGUATKUASAAN

## *PRIORITISING SAFETY AND ENFORCEMENT*



Bersempena Ulang Tahun Penubuhan Suruhanjaya Tenaga (ST) ke-20 pada 2021, ST telah menyemak semula Visi, Misi, *Corporate House* dan Nilai Teras bagi mempertingkatkan hala tuju organisasi, bertujuan untuk terus memperkemaskan fokus warga kerja dan pihak berkepentingan terhadap sasaran strategik, pelaksanaan kawal selia dan kualiti perkhidmatannya.

*Corporate House* 2022 menekankan Teras Strategik Kemampanan Tenaga yang berdiri sendiri, untuk mempamerkan komitmen ST terhadap agenda *Net Zero Emission* 2050. Susunan Teras-teras Strategik bagi *Corporate House* 2022 juga turut dirombak agar selaras dengan Misi ST.

Hala tuju baharu ini telah diluluskan oleh ST pada 2022.

Bagi mempromosikan hala tuju strategik baharu ini, Laporan Tahunan berfungsi sebagai salah satu platform dalam penyampaian lima (5) Teras Strategik dan dua (2) Pemboleh Upaya yang selaras dengan tanggungjawab ST dalam mengawal selia keselamatan, keberterusan, daya harap pembekalan dan kualiti perkhidmatan, kecekapan ekonomi dan kemampuan serta kemampanan industri elektrik dan gas berpaip di Malaysia.

Reka bentuk serta rasional kulit hadapan Laporan Tahunan ST 2022 dan laporan-laporan akan datang akan didedikasikan untuk fungsi dan skop bagi setiap Teras Strategik dan Pemboleh Upaya agar pemegang taruh dan pembaca dapat bersama-sama dalam perjalanan masa hadapan kami.

*In conjunction with the Energy Commission's 20<sup>th</sup> Anniversary in 2021, the Commission revised its Vision, Mission, Corporate House and Core Values to further enhance the organisation's directions, aimed to further streamline the employees' and stakeholders' focus on its strategic targets, regulatory deliverables and service quality.*

*The 2022 Corporate House highlights a stand-alone Strategic Pillar of Energy Sustainability to showcase the Commission's commitment towards the Net Zero Emission 2050 agenda. The 2020 Corporate House Strategic Pillars have also been reshuffled in line with the Commission's Mission.*

*These new directions were approved by the Commission in 2022.*

*To promote these new strategic directions, the Annual Report serves as one of the platforms for communicating the five (5) Strategic Pillars and two (2) Enablers in accordance with the Commission's responsibilities regulating energy safety, security, supply reliability and service quality, economic efficiency and affordability, and sustainability of electricity and piped gas industry in Malaysia.*

*The cover design and rationale for the Commission's Annual Report 2022 and future reports will be dedicated to functions and scopes for each Strategic Pillars and Enablers, for the Commission's stakeholders and readers to embark on the future journey with us.*

## **TERAS STRATEGIK 1: MENGUTAMAKAN KESELAMATAN DAN PENGUATKUASAAN**

ST melindungi orang ramai daripada bahaya yang berpunca daripada pembekalan dan infrastruktur elektrik dan gas berpaip dengan usaha terus-menerus dalam memperkukuhkan kod dan garis panduan keselamatan sedia ada, pemantauan dan penguatkuasaan, di samping usaha-usaha mempromosikan pengawalseliaan sendiri dalam industri.

ST juga memanfaatkan kerjasama baharu dan sedia ada dengan pelbagai pihak berkepentingan bagi menguatkuasakan polisi dan dasar keselamatan, di samping mempertingkatkan tahap kompetensi dalam industri, sejajar dengan kemunculan teknologi baharu dan peningkatan tahap kesedaran pengguna.

Kesemua aspek-aspek ini dimanifestasi dalam reka bentuk muka hadapan Laporan Tahunan ini. Bentuk bulat yang merupakan komponen utama reka bentuk ini melambangkan keterangkuman dan peranan ST sebagai badan kawal selia tenaga. Gambar-gambar dan ikon-ikon yang digunakan pula melambangkan skop kawal selia dan tanggungjawab ST termasuk dari segi memastikan pembekalan elektrik dan gas berpaip yang selamat untuk terus dinikmati semua, sekaligus menggalakkan peningkatan ekonomi negara.

Gambar mentol LED menunjukkan sokongan ST terhadap penggunaan tenaga secara cekap, selain menggambarkan idea-idea bernas oleh ST dalam membangunkan sektor tenaga, termasuk dari segi memperkukuhkan aspek keselamatan. Garis-garis juga ditambah sebagai grafik sekunder untuk menampakkan kemodenan dan kecanggihan serta ketersediaan ST menyertai arus modenisasi dan digitalisasi.

Dengan latar berwarna putih yang melambangkan keluhuran dan ketulusan ST dalam menjaga kepentingan orang awam dan pihak-pihak berkepentingan, rona-rona biru mendominasi reka bentuk ini melambangkan kebijaksanaan, autoritatif, dan kebolehpercayaan ST dalam menjalankan tanggungjawab ini.

## **STRATEGIC PILLAR 1: PRIORITISING SAFETY AND ENFORCEMENT**

*The Commission protects the public from hazards associated with electrical and piped gas supply and infrastructure with continuous efforts in strengthening existing safety codes and guidelines, monitoring and enforcement, as well as promoting self-regulation within the industry.*

*The Commission also leverages new and existing collaborations with various stakeholders to enforce safety policies and standards, while enhancing industry competence in line with emerging technologies and increasing consumer awareness.*

*All these aspects are manifested in the design of this Annual Report. The circular shape, which is the main component of the design, symbolises the inclusiveness and the Commission's role as an energy regulator. The images and icons used represent the scope of regulatory oversight and the Commission's responsibilities, including ensuring a safe supply of electricity and piped gas for all, while encouraging the country's economic growth.*

*The LED lightbulb image signifies the Commission's support for efficient energy use and represents the Commission's insightful ideas for developing the energy sector, including in strengthening the safety aspects. The addition of lines serves as secondary graphics to depict modernity, sophistication, and the Commission's readiness to embrace modernisation and digitalisation.*

*With a white background symbolising the Commission's integrity and sincerity in safeguarding the interests of the public and stakeholders, the dominant blue tones in this design represent the wisdom, authoritative nature, and trustworthiness of the Commission in carrying out these responsibilities.*

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# PERUTUSAN PENGERUSI

## CHAIRMAN'S MESSAGE

### **DATO' AZIAN OSMAN**

Pengerusi Suruhanjaya Tenaga  
*Chairman of the Energy Commission*

### **ASSALAMUALAIKUM W.B.T. DAN SALAM SEJAHTERA**

Sebagai badan kawal selia sektor tenaga negara, Suruhanjaya Tenaga (ST) sentiasa berusaha untuk memastikan keberterusan dan kualiti bekalan tenaga bagi pengguna pelbagai lapisan masyarakat dan sektor perniagaan di negara ini. Melalui peraturan dan perundangan yang efektif, ST juga membantu mengekalkan aspek keselamatan bagi keseluruhan sistem pembekalan tenaga iaitu penjanaan, penghantaran dan pengagihan, serta penggunaan oleh orang ramai.

*As the country's energy sector regulatory body, the Energy Commission (the Commission) always endeavours to ensure the security and quality of energy supply for consumers from various segments of society and business sectors in the country. Through effective regulations and legislation, the Commission also contributes to maintaining safety aspects for the entire energy supply system, including generation, transmission, distribution, and public consumption.*



Kerana itu, saya dengan penuh hormat menerima kepercayaan Kerajaan untuk terus menggalas tanggungjawab menerajui ST menerusi pelantikan tempoh pelantikan saya sebagai Pengerusi ST pada 8 Mei 2022 yang lalu. Sehubungan itu, saya dengan sukacitanya membentangkan Laporan Tahunan ST bagi tahun 2022, agar keberkesanan prestasi dan inisiatif di bawah tanggungjawab ST boleh dinilai dan ditambah baik demi memperkukuhkan lagi industri tenaga negara pada masa akan datang.

Tidak dinafikan, tahun 2022 menyaksikan pelbagai peristiwa dan cabaran-cabaran besar bagi sektor tenaga lebih-lebih lagi di peringkat global. Di saat seluruh dunia sedang bangkit semula memulihkan sektor ekonomi pasca COVID-19, krisis Rusia-Ukraine turut memberi tamparan terutama apabila sekatan ekonomi dikenakan terhadap antara negara pengeluar bahan api utama dunia itu, yang membawa kepada pengurangan bekalan serta peningkatan harga bahan api di pasaran.

Situasi ini telah mencetuskan keperluan untuk mengambil langkah kesiapsiagaan yang lebih realistik dan dinamik bagi menangani kekurangan bekalan dan kenaikan harga bahan api. Untuk itu, ST menubuhkan **Pasukan Petugas Sekuriti Bahan Api Jangka Pendek (FST) dengan objektif untuk membangunkan strategi aras tinggi dan pelan tindakan dalam menangani cabaran sekuriti bekalan bahan api di Semenanjung**. Skop FST kemudiannya diperluas bagi mengesyorkan pelan tindakan komprehensif dalam menjamin sekuriti bekalan elektrik di Semenanjung melangkaui keperluan sekuriti bekalan bahan api sahaja.

Beberapa risiko utama industri pembekalan elektrik telah dikenal pasti melalui satu bengkel anjuran ST bersama pemegang taruh pada 12 Oktober 2022, antaranya adalah kebergantungan yang tinggi terhadap sumber arang batu dari Indonesia, kekangan gas domestik dan teknologi serta sumber penjanaan yang terhad. Perincian inisiatif bagi menghadapi risiko-risiko ini akan dilaksanakan tahun hadapan.

Selain itu, krisis tenaga dunia ini turut membuka mata semua pihak agar langkah drastik boleh diambil untuk menyegerakan transisi ke arah tenaga boleh baharu (TBB) dan mampan.

*Hence, I am honoured to accept the Government's trust in extending my term as the Commission's Chairman on 8 May 2022. In this regard, I am pleased to present the Commission's Annual Report for the year 2022, so that the effectiveness of performance and initiatives under the Commission's responsibility can be evaluated and improved on to further strengthen the national energy industry in the future.*

*Undeniably, the year 2022 witnessed various significant events and challenges for the energy sector, especially on a global scale. While the world was striving to recover and revitalise the economy post-COVID-19, the Russia-Ukraine crisis also had an impact, particularly with economic sanctions imposed on the among major oil producing country, resulting in supply reductions and an increase in fuel prices in the market.*

*This situation has prompted the need for a more realistic and dynamic preparedness to address fuel supply shortages and price increases. To address these challenges, the Commission has established the **Short-Term Fuel Security Task Force (FST) with the objective of developing high-level strategies and action plans to tackle fuel supply security challenges in the Peninsula**. The scope of FST was later expanded to recommend a comprehensive action plan to ensure electricity supply security in the Peninsula beyond just fuel supply security concerns.*

*Several key risks in the electricity supply industry have been identified through a workshop organised by the Commission with stakeholders on 12 October 2022. These risks include high dependence on coal sources from Indonesia, constraints in domestic gas and technology, and limited generation sources. Detailed initiatives to address these risks will be implemented in the coming year.*

*The global energy crisis has also served as a wake-up call for all parties to take drastic measures to expedite the transition towards sustainable and renewable energy (RE) sources.*

“**Malaysia tidak ketinggalan untuk menyertai perubahan landskap tenaga dunia dengan pelancaran Dasar Tenaga Negara (DTN) 2022-2040 pada 19 September 2022. Ini merupakan komitmen Kerajaan untuk usaha yang lebih pragmatik bagi merealisasikan peralihan kepada tenaga lestari.**

”

DTN ini disokong oleh tiga (3) objektif iaitu meningkatkan daya tahan ekonomi makro dan jaminan bekalan tenaga, mencapai kesaksamaan sosial menerusi tenaga mampu bayar, serta memastikan kelestarian alam sekitar. Pelan ini memberi penekanan terhadap aspirasi Kerajaan dalam mencapai sasaran negara sifar bersih karbon seawal 2050 termasuk keputusan Kerajaan untuk tidak melaksanakan pembangunan stesen jana kuasa arang batu baharu. Berdasarkan pelan pembangunan yang diluluskan tersebut, kapasiti arang batu pada 2041 di Semenanjung diunjurkan berkurangan kepada 3,000 MW berbanding 12,061 MW pada 2022.

Satu pencapaian utama dalam pembangunan tenaga lestari negara yang juga merupakan inisiatif perintis dalam sektor pembekalan elektrik telah dimulakan di Pulau Redang, Pulau Perhentian dan Pulau Tioman. Projek yang diberi nama **Pulau Tenaga Hijau (PTH) bukan sahaja dapat menyediakan bekalan elektrik yang konsisten pada harga yang berpatutan, malah ia juga menggunakan tenaga yang rendah pelepasan karbon.**

Projek PTH adalah berteraskan penggunaan tenaga yang lebih lestari dan mesra alam, iaitu dengan menggunakan teknologi *Rooftop Solar PV*, *Vertical Axis Wind Turbine (VAWT)* dan gas asli cecair (LNG) sebagai sumber penjanaan elektrik. Infrastruktur Grid Pintar dan Meter Pintar, *Geographic Information System (GIS)*, *Battery Energy Storage System (BESS)*, *Energy Management System (EMS)* dan *Supervisory Control and Data Acquisition/Distribution Automation (SCADA/DA)* juga akan dipasang di seluruh pulau bagi persediaan untuk menerima lebih banyak penjanaan berasaskan TBB serta mengurus penjanaan TBB dengan lebih efisien dan efektif. Di samping itu, sistem retikulasi yang lebih terancang juga akan dibina di seluruh pulau bagi memastikan bekalan elektrik yang stabil dapat dinikmati oleh penduduk pulau.

“**Malaysia is also taking part in joining the change in global energy landscape with the launch of the National Energy Policy (NEP) 2022-2040 on 19 September 2022. This represents the Government's commitment to a more pragmatic effort in realising the transition towards sustainable energy.**

”

*The NEP is supported by three (3) objectives: enhancing macroeconomic resilience and energy security; achieving social equity through affordable energy; and ensuring environmental sustainability. The plan emphasises the Government's aspirations to achieve a net-zero carbon nation by as early as 2050, including the decision not to proceed with the construction of new coal-fired power stations. Based on the approved development plan, the coal capacity in the Peninsula is projected to decrease to 3,000 MW by 2041 compared to 12,061 MW in 2022.*

*One significant achievement in the development of sustainable energy in the country, which also serves as a pioneering initiative in the electricity supply sector, has been initiated on Pulau Redang, Pulau Perhentian, and Pulau Tioman. The project, named **Green Energy Island (also known as PTH)**, not only provides a consistent and affordable electricity supply but also utilises low-carbon emission energy sources.*

*The PTH project is based on the use of more sustainable and eco-friendly energy technologies, such as Rooftop Solar PV, Vertical Axis Wind Turbine (VAWT), and liquefied natural gas (LNG) as electricity generation sources. Smart Grid and Smart Meter infrastructure, Geographic Information System (GIS), Battery Energy Storage System (BESS), Energy Management System (EMS), and Supervisory Control and Data Acquisition/Distribution Automation (SCADA/DA) will also be installed across the islands to prepare for receiving more RE-based generation and to manage RE generation more efficiently and effectively. In addition, a more well-planned reticulation system will be built throughout the islands to ensure a stable electricity supply can be enjoyed by the islands' residents.*



Kejayaan projek ini bakal memberi jalan penyelesaian kepada pembekalan elektrik yang konsisten pada harga yang berpatutan di pulau-pulau lain di seluruh negara, sekaligus menyokong hasrat Kerajaan untuk mencapai pelepasan karbon sifar bersih menjelang 2050.

Selain itu, ST turut memperkenalkan inisiatif lain berkenaan tenaga hijau. **Green Electricity Tariff (GET) menawarkan bekalan elektrik daripada sumber TBB kepada pengguna TNB yang berhasrat untuk mengurangkan jejak karbon dan memenuhi sasaran Environmental, Social, and Governance (ESG) syarikat masing-masing. Permohonan yang dibuka pada 1 Disember 2021 menerima sambutan yang baik di mana kesemua kuota sebanyak 4,000 GWj yang ditawarkan telah dilanggan sepenuhnya oleh 2,035 pengguna pada April 2022.**

Sambutan yang memberangsangkan ini menunjukkan kesediaan dan sokongan pengguna tenaga dalam negara ke arah industri tenaga yang mampan. Ia juga dapat dilihat melalui jumlah penyertaan **New Enhanced Dispatch Arrangement (NEDA) yang meningkat pada 2022 dengan kemasukan Eastern Power Resources dengan kapasiti sebanyak 29.9 MW, menjadikan jumlah keseluruhan penyertaan NEDA sebanyak 131.20 MW.**

Selain itu, terdapat tiga (3) stesen jana kuasa solar sedang dalam proses pembangunan dan dijangka mula beroperasi pada 2023 dan 2024. Stesen jana kuasa tersebut merupakan peserta bagi kategori *Price Taker* yang bakal meningkatkan lagi penyertaan NEDA.

Penyertaan ke NEDA melalui pembangunan stesen jana kuasa solar dijangka akan semakin meningkat apabila Kerajaan melancarkan Program Tenaga Hijau Korporat (CGPP). **Selaras dengan hasrat Kerajaan untuk meningkatkan penggunaan TBB ke dalam campuran bahan api sektor penjanaan di Semenanjung, kapasiti sebanyak 600 MW diperuntukkan untuk dibangunkan melalui program CGPP di mana stesen-stesen jana kuasa solar ini disasarkan untuk mula beroperasi sebelum atau pada 2025.**

*The success of this project is expected to provide a solution for consistent and affordable electricity supply to other islands across the country, thereby supporting the Government's ambition to achieve net-zero carbon emissions by 2050.*

*Moreover, the Commission has introduced other green energy initiatives. **The Green Electricity Tariff (GET) offers electricity supply from RE sources to TNB consumers who aim to reduce their carbon footprint and meet their businesses' respective Environmental, Social, and Governance (ESG) targets. The application, which was opened on 1 December 2021, received a positive response, with all 4,000 GWh of the offered quota fully subscribed by 2,035 users by April 2022.***

*This encouraging response demonstrates the readiness and support of energy consumers in the country towards a sustainable energy industry. It is further evident through the increased participation in the **New Enhanced Dispatch Arrangement (NEDA) in 2022, with the addition of Eastern Power Resources with a capacity of 29.9 MW, bringing the total NEDA participation to 131.20 MW.***

*Furthermore, there are three (3) solar power plants currently under construction and expected to begin operations in 2023 and 2024. These power plants are participants in the *Price Taker* category, which will further increase participation in NEDA.*

*Participation in NEDA through the development of solar power plants is expected to increase further when the Government launches the Corporate Green Power Programme (CGPP). **Aligned with the Government's intention to increase the use of RE sources in the power generation fuel mix in the Peninsula, a capacity of 600 MW has been allocated for development through the CGPP. These solar power plants are targeted to be operational before or in 2025.***

Walaupun penggunaan tenaga hijau terutama solar menunjukkan perkembangan yang baik, namun peningkatan kemasukan TBB yang tidak terkawal ke dalam grid terutamanya di pihak pengguna akan memberi implikasi teknikal dan kos kepada keseluruhan sistem pembekalan elektrik. Untuk itu, beberapa kajian dilaksanakan dalam meneliti impak ini termasuk solusi teknikal kepada sistem grid, serta bagi mendapatkan keseimbangan di antara kos-kos yang terlibat. Ini termasuk **kajian True Cost of Variable RE (Solar PV) Integration into Power System Network of Peninsular Malaysia yang dijalankan untuk mengenal pasti perkara-perkara yang berkaitan dengan kemasukan sistem solar PV. Ini termasuk kos integrasi yang perlu ditanggung oleh sistem untuk menyokong kemasukan solar, kerangka pengagihan kos yang adil kepada pemegang taruh berkaitan serta impak program-program solar kepada pembangunan sosio-ekonomi negara.**

Hasil kajian merumuskan mekanisme pengiraan *Net Cost Benefit* (NCB) bagi menilai keutamaan untuk pelaksanaan sesuatu program solar, di mana nilai NCB yang lebih tinggi bermakna manfaat yang dibawa oleh pelaksanaan program solar tersebut adalah lebih besar kepada sistem. Hasil kajian akan menjadi salah satu rujukan bagi membantu ST dan Kerajaan dalam menentukan program-program solar yang mampu memberi impak positif kepada sistem dan juga pengguna-pengguna elektrik secara amnya.

Satu lagi cabang pembangunan tenaga hijau adalah galakan terhadap teknologi kenderaan elektrik. ST menyambut baik kesedaran pengguna untuk beralih kepada kenderaan hijau, namun menyedari terdapat keperluan untuk memastikan instrumen keselamatan yang kukuh dalam sektor berkenaan. Sehubungan itu, **ST telah membangunkan *Guide on Electrical Vehicle Charging System (EVCS)*, sebagai panduan ringkas untuk memastikan EVCS mematuhi semua keperluan di bawah akta, peraturan dan piawaian berkaitan serta bagi menetapkan standard dan spesifikasi minimum dalam reka bentuk, pemasangan, pemeriksaan, ujian, penyeliaan, pengendalian dan penyelenggaraan EVCS.**

*While the adoption of green energy, especially solar, is showing promising progress, uncontrolled increases of RE into the grid, particularly on the consumer side, will have technical and cost implications for the overall electricity supply system. To address this, several studies were conducted to examine the impact, including technical solutions for grid systems, and to strike a balance among the associated costs. This includes **the study on the True Cost of Variable RE (Solar PV) Integration into the Power System Network of Peninsular Malaysia, aimed at identifying factors related to the integration of solar PV systems. This involves the integration that the system needs to bear to support solar integration, a fair cost allocation framework for stakeholders, and the socio-economic impacts of solar programmes on the country's development.***

*The research results in formulating the mechanism for calculating the Net Cost Benefit (NCB) to assess the priority of implementing a solar programme, where a higher NCB value indicates that the benefits brought by the implementation of the solar programme are greater for the system. The research findings will serve as one of the references to assist the Commission and the Government in determining solar programmes that brings positive impact to the system and electricity consumers in general.*

*Another branch of green energy development is the promotion of electric vehicle (EV) technology. The Commission welcomes the awareness among users to switch to green vehicles but acknowledges the need to ensure strong safety measures in this sector. Therefore, **the Commission has developed the Guide on Electric Vehicle Charging System (EVCS), a concise guide to ensure that EVCS complies with all relevant acts, regulations, and standards, and to establish minimum design, installation, inspection, testing, supervision, operation, and maintenance standards and specifications for EVCS.***

Boleh didapati di laman sesawang ST di [www.st.gov.my](http://www.st.gov.my), panduan ini diharap dapat menjadi sumber rujukan yang jelas, ringkas dan padat kepada Orang Kompeten, Kontraktor Elektrik, Jurutera Perunding dan individu yang terlibat untuk memastikan sistem pendawaian elektrik di pemasangan EVCS dilaksanakan dengan sempurna, tanpa gangguan sistem bekalan dan selamat, sekaligus mengurangkan risiko kemalangan.

Pada masa sama, **tahun 2022 juga mencatat pencapaian signifikan bagi sektor pasaran gas di Semenanjung, dengan pembukaan segmen pasaran pengagihan gas pada 1 Januari 2022.** Pembukaan ini menyediakan ruang dan peluang kepada pengguna untuk membincangkan keperluan dan berunding syarat-syarat bekalan, sebelum memilih pembekal pilihan mereka.

Berikutan pembukaan ini, sebanyak tiga (3) *shipper* baharu didaftarkan untuk membekalkan gas kepada pelbagai pengguna dalam segmen pasaran pengagihan iaitu Petronas Energy and Gas Trading Sdn. Bhd., Shell Malaysia Trading Sdn. Bhd. dan Petrolife Aero Sdn. Bhd., selain *shipper* penyandang Gas Malaysia Energy and Services Sdn. Bhd.

Sektor tenaga merupakan komponen penting dalam pertumbuhan ekonomi negara. Walaupun dengan pelbagai cabaran dan rintangan sepanjang 2022, sektor tenaga negara menunjukkan perkembangan yang baik lebih-lebih lagi berkaitan inisiatif tenaga lestari dan liberalisasi. Namun, masih terdapat ruang-ruang penambahbaikan yang boleh dikemas kini seiring dengan perkembangan teknologi semasa bagi menjadikan sektor tenaga kalis cabaran masa hadapan.

Sesungguhnya tanggungjawab ST untuk mengemudikan sektor tenaga negara amat menghargai sokongan penuh daripada pihak Kerajaan. Untuk itu, saya bagi pihak ST ingin mengucapkan setinggi-tinggi penghargaan kepada YB Datuk Seri Takiyuddin Hassan, mantan Menteri Tenaga dan Sumber Asli atas kerjasama beliau dan seluruh warga Kementerian Tenaga dan Sumber Asli terhadap usaha-usaha ST. Saya juga ingin mengalu-alukan pelantikan YB Tuan Nik Nazmi Nik Ahmad, Menteri Sumber Asli, Alam Sekitar dan Perubahan Iklim yang baharu dan yakin di bawah kepimpinan beliau, ST dan Kementerian dapat bekerja bersama dalam meningkatkan prestasi sektor tenaga negara.

*Available on the Commission's website at [www.st.gov.my](http://www.st.gov.my), this guide is expected to be a clear, concise, and comprehensive reference for Competent Persons, Electrical Contractors, Consulting Engineers, and individuals involved, to ensure that the electrical wiring systems for EVCS installations are executed perfectly, without disrupting the supply system and is safe, thus, reducing accident risks.*

*Simultaneously, **the year 2022 also marked significant achievements in the gas market sector in the Peninsula, with the opening of the gas distribution market segment on 1 January 2022.** This opening provides space and opportunities for consumers to discuss their needs and negotiate supply terms before selecting their preferred suppliers.*

*Following this opening, three (3) new shippers were registered to supply gas to various consumers in the gas distribution market segment, namely Petronas Energy and Gas Trading Sdn. Bhd., Shell Malaysia Trading Sdn. Bhd., and Petrolife Aero Sdn. Bhd., in addition to the existing shipper, Gas Malaysia Energy and Services Sdn. Bhd.*

*The energy sector is a crucial component in the country's economic growth. Despite various challenges and obstacles throughout 2022, the nation's energy sector has shown positive developments, especially in sustainable energy initiatives and liberalisation. However, there are still areas of improvement that can be updated in line with current technological advancements to make the energy sector resilient to future challenges.*

*Indeed, the Commission sincerely appreciates the Government's full support in driving the nation's energy sector. On behalf of the Commission, I would like to express the highest appreciation to YB Datuk Seri Takiyuddin Hassan, the former Minister of Energy and Natural Resources, for his and the entire Ministry's co-operation towards the Commission's efforts. I warmly welcome the appointment of YB Tuan Nik Nazmi Nik Ahmad as the new Minister of Natural Resources, Environment and Climate Change, and I am confident that under his leadership, the Commission and the Ministry can work together to enhance the performance of the nation's energy sector.*



Turut dialu-alukan adalah pelantikan Anggota Suruhanjaya yang baharu iaitu Tuan Mohd Sukri Mat Jusoh dan Dato' Mohamad Razif Haji Abd Mubin. Saya juga ingin merakamkan ucapan terima kasih kepada semua Anggota Suruhanjaya yang sama-sama mencurahkan ilmu pengetahuan, bakti dan pengalaman masing-masing dalam memajukan industri tenaga.

Akhir sekali, saya juga ingin mengambil kesempatan ini untuk mengucapkan tahniah kepada semua warga ST, khususnya Dato Ir. Ts. Abdul Razib Dawood, Ketua Pegawai Eksekutif ST atas Anugerah Pengiktirafan Khas oleh Pasukan Petugas Khas Pemudahcara Perniagaan (PEMUDAH) pada Februari 2022. Anugerah ini diberikan atas dedikasi dan komitmen ST ke arah penyediaan persekitaran perniagaan yang bersesuaian, khususnya dalam kemudahan untuk mendapatkan bekalan elektrik.

Anugerah ini menunjukkan hasil usaha dan komitmen kesemua warga ST dalam menjalankan tugas masing-masing dalam memberikan perkhidmatan terbaik kepada semua pemegang taruh ST. Melangkah ke hadapan, saya berharap agar komitmen ini diteruskan agar visi ST untuk menjadi badan kawal selia bertaraf dunia dapat direalisasikan.

*I also welcome the new Commission Members, Tuan Mohd Sukri Mat Jusoh and Dato' Mohamad Razif Haji Abd Mubin. I would also like to express my gratitude to all Commission Members who have devoted their knowledge, dedication and experience to advancing the energy industry.*

*Lastly, I would like to take this opportunity to congratulate the workforce behind the Commission, especially Dato Ir. Ts. Abdul Razib Dawood, the Commission's Chief Executive Officer, on receiving the Special Recognition Award by the Special Task Force to Facilitate Business (PEMUDAH) in February 2022. This award was given in recognition of the Commission's dedication and commitment towards providing a conducive business environment, particularly in facilitating access to electricity supply.*

*This award reflects the efforts and commitment of the workforce behind the Commission in carrying out their respective duties to provide the best services to the Commission's stakeholders. Moving forward, I hope that this commitment will continue so that the Commission's vision of becoming a world-class regulator can be realised.*

## DATO' AZIAN OSMAN

Pengerusi Suruhanjaya Tenaga  
Chairman of the Energy Commission

# LAPORAN KETUA PEGAWAI EKSEKUTIF

## CHIEF EXECUTIVE OFFICER'S REPORT

### **DATO' IR. TS. ABDUL RAZIB DAWOOD**

Ketua Pegawai Eksekutif Suruhanjaya Tenaga  
*Chief Executive Officer of the Energy Commission*

### **ASSALAMUALAIKUM W.B.T. DAN SALAM SEJAHTERA**

Terlebih dahulu, bagi pihak pengurusan dan warga kerja Suruhanjaya Tenaga (ST), saya mengucapkan tahniah kepada YBhg. Dato' Azian Osman atas pelanjutan tempoh perkhidmatan sebagai Pengerusi Suruhanjaya Tenaga berkuat kuasa 8 Mei 2022. Semoga ST kekal berkesan dan berwibawa di bawah kepimpinan YBhg. Dato'.

*On behalf of the management and employees of the Energy Commission (the Commission), I would like to congratulate YBhg. Dato' Azian Osman on the extension of his tenure as the Commission's Chairman, effective from 8 May 2022. May the Commission remain effective and authoritative under his leadership.*



Tahun 2022 merupakan tahun yang mencabar bagi sektor tenaga, bukan sahaja di Malaysia malah di seluruh dunia. Di peringkat global, pasaran tenaga menerima implikasi hebat berikutan perang Rusia-Ukraine, memandangkan Moscow merupakan pengeluar gas asli kedua terbesar di dunia serta salah sebuah pengeluar minyak terbesar di dunia. Ia juga menjadi pemangkin kenaikan harga arang batu apabila Kesatuan Eropah menimbang semula bekalan tenaganya berikutan perang tersebut, sehingga harga komoditi itu mencapai paras tertinggi pasaran global iaitu USD415/MT pada Mei 2022.

Di Indonesia pula, pengeluaran arang batu yang terjejas akibat faktor cuaca, kekurangan buruh dan beberapa isu rantai bekalan mendorong Kerajaan Indonesia mengeluarkan arahan larangan eksport arang batu bagi tempoh 1 hingga 31 Januari 2022. Walaupun bersifat sementara, larangan ini mengakibatkan pelaksanaan catuan penggunaan arang batu di stesen-stesen jana kuasa Semenanjung bagi tujuan penyimpanan stok sedia ada.

Selain itu, kerancangan sektor ekonomi kian terasa dengan pembukaan semula pelbagai bidang industri dan komersial setelah penamatan tempoh Perintah Kawalan Pergerakan (PKP) akibat penularan COVID-19. Dengan prestasi yang memberangsangkan, Keluaran Dalam Negara Kasar (KDNK) mencatat pertumbuhan sebanyak 8.7% untuk 2022, peningkatan 3.1% berbanding tahun sebelumnya. Malaysia juga merekodkan pelaburan langsung asing (FDI) bersih sebanyak RM19.3 bilion pada suku keempat 2022, berbanding RM12.3 bilion suku ketiga tahun yang sama.

Perkembangan ini secara tidak langsung meningkatkan semula kadar penggunaan tenaga dalam negara. Ini dapat dilihat daripada **peningkatan permintaan puncak sistem grid di Semenanjung yang mencatatkan rekod tertinggi sebanyak 19,183 MW pada 24 Mei 2022, peningkatan sebanyak 3.2% berbanding 18,585 MW pada 2021. Jumlah penajaan elektrik di Semenanjung pada 2022 mencatatkan peningkatan sebanyak 4.08% kepada 130,625 GWj, berbanding 125,503 GWj pada 2021. Di Sabah pula, permintaan puncak dicatatkan pada 1,032.1 MW bagi 2022, iaitu peningkatan sebanyak**

*The year 2022 has been a challenging one for the energy sector, not only in Malaysia but also worldwide. Globally, the energy market faced significant implications due to the Russia-Ukraine conflict, considering Moscow is the second-largest producer of natural gas and one of the largest oil producers in the world. This has also contributed to the surge in coal prices, as the European Union reconsidered its energy supply following the conflict, leading to the commodity reaching its highest global market price of USD 415/MT in May 2022.*

*In Indonesia, the production of coal was affected by weather conditions, labour shortages, and supply chain issues, prompting the Indonesian Government to impose a ban on coal exports for the period from 1 to 31 January 2022. Although temporary in nature, this ban resulted in the implementation of coal rationing at power plant stations in the Peninsula for the purpose of stock preservation.*

*In addition, the pace of economic activities accelerated with the reopening of various industrial and commercial sectors after the lifting of the Movement Control Order (MCO) due to the spread of COVID-19. With commendable performance, Malaysia's Gross Domestic Product (GDP) recorded a growth of 8.7% for 2022, representing a 3.1% increase compared to the previous year. Malaysia also recorded a net foreign direct investment (FDI) of RM19.3 billion in the fourth quarter of 2022, compared to RM12.3 billion in the third quarter of the same year.*

*These developments indirectly led to a resurgence in the domestic energy consumption rate. This can be observed from the **peak demand of the grid system in the Peninsula, which reached a record high of 19,183 MW on 24 May 2022, representing a 3.2% increase compared to 18,585 MW in 2021. The total electricity generation in the Peninsula in 2022 increased by 4.08% to 130,625 GWh, compared to 125,503 GWh in 2021. In Sabah, the peak demand recorded in 2022 was 1,032.1 MW, a 2.9% increase compared to 2021. The total annual supply recorded for 2022 was 6,911.9 GWh, a 3.9% increase compared to 2021.***



**2.9% berbanding 2021. Jumlah pembekalan tahunan yang direkodkan bagi 2022 adalah sebanyak 6,911.9 GWJ, peningkatan sebanyak 3.9% berbanding 2021.**

## Mengutamakan Keselamatan dan Penguatkuasaan

Isu keselamatan pengguna elektrik dan gas berpaip terus menjadi keutamaan ST, di mana usaha-usaha penambahbaikan giat dijalankan termasuk melalui penguatkuasaan yang lebih tegas. Usaha ini tampak berhasil apabila terdapat **pengurangan kes kemalangan elektrik sepanjang 2022 kepada 58 kes (28 maut dan 30 tidak maut) berbanding 69 kes tahun sebelumnya**. Dari segi kadar kes kemalangan mengikut populasi, purata kes bagi setiap sejuta penduduk bagi tempoh lima (5) tahun sejak 2018 menunjukkan penurunan kepada 1.86, berbanding 1.89 untuk tempoh lima (5) tahun sebelumnya.

Kadar kemalangan tertinggi direkodkan di kawasan talian atas voltan rendah dengan 12 kes, diikuti kawasan kediaman (11), talian atas voltan tinggi (8) dan tapak pembinaan (6). Antara punca utama adalah pemasangan dan senggaraan yang tidak sempurna, ketidakpatuhan terhadap prosedur kerja selamat serta aktiviti kerja orang awam berhampiran dengan pemasangan elektrik.

Untuk **kes kemalangan gas berpaip pula, sebanyak satu (1) kes direkodkan**, menjadikan jumlah kes bagi tempoh lima (5) tahun sebanyak enam (6) kes.

Pelbagai inisiatif turut dijalankan bagi meningkatkan tahap keselamatan elektrik dan gas berpaip, termasuk program kesedaran keselamatan bersama agensi-agensi kerajaan, pihak berkuasa tempatan (PBT), pihak utiliti, industri, pemegang taruh dan golongan sasar di seluruh negara, di samping hebahan melalui media massa. Selain itu, aktiviti penguatkuasaan turut dipertingkatkan melalui 1,342 pemeriksaan dan operasi penguatkuasaan terhadap 80 premis yang disyaki melanggar peraturan dan undang-undang berkaitan.

## Prioritising Safety and Enforcement

*The safety of electricity and piped gas consumers remains a top priority for the Commission, and efforts to improve safety are carried out vigorously, including through stricter enforcement. These efforts have proven to be successful, as there was a **reduction in electrical accidents in 2022 to 58 cases (28 fatal and 30 non-fatal) compared to 69 cases in the previous year**. In terms of accident rates per population, the average number of cases per one million population for the five (5) years since 2018 showed a decrease to 1.86, compared to 1.89 for the preceding five (5) years.*

*The highest accident rate was recorded in low-voltage overhead lines area with 12 cases, followed by residential areas (11), high voltage overhead lines (8) and construction sites (6). Among the main causes were improper installation and maintenance, non-compliance with safety procedures, and public activities near electrical installations.*

*In regard to **piped gas accidents, one (1) case was recorded**, making the total number of cases for the past five (5) years increased to six (6).*

*Various initiatives are also being implemented to enhance the safety of electricity and piped gas, including safety awareness programmes in collaboration with government agencies, local authorities (PBT), utility companies, industries, stakeholders, and targeted groups throughout the country, along with promotion through mass media. Additionally, enforcement activities have been intensified through 1,342 inspections and enforcement operations targeting 80 premises suspected of violating relevant regulations and laws.*



## Memperkuhkan Keberterusan Bekalan Tenaga

Dalam menjamin kesinambungan pembangunan negara bagi jangka masa panjang, keberterusan bekalan tenaga merupakan satu aspek penting yang diberi pemantauan khusus oleh ST. Dengan keperluan tenaga yang semakin meningkat seiring dengan pertumbuhan ekonomi dan keperluan masyarakat yang semakin berkembang, pelbagai langkah strategik yang sesuai dengan transisi ke arah tenaga yang lebih bersih telah digaris dan diambil tindakan.

Ke arah objektif tersebut, **Kerajaan telah mengekalkan sasaran kapasiti tenaga boleh baharu (TBB) di Malaysia sebanyak 31% menjelang 2025 dan seterusnya 40% menjelang 2040.** Pada 2022, sebanyak enam (6) projek ladang solar berskala besar (LSS) ditambah ke dalam sistem, dengan beberapa lagi dijadualkan beroperasi menjelang akhir 2023.

**Margin rizab pada 31 Disember 2022 di Semenanjung adalah sebanyak 40% berbanding 42% pada 2021.** Kadar ini dijangka akan menurun kepada 36% pada 2023, dan seterusnya ke lingkungan kadar rizab margin optimum iaitu 20% mulai 2030. **Di Sabah pula, margin rizab mencatatkan sedikit peningkatan kepada 23%, berbanding 19% pada 2021.** Jumlah ini bagaimanapun masih belum mencapai paras optimum 30%, didorong oleh prestasi stesen-stesen jana kuasa sedia ada yang kurang memuaskan, serta kekangan kapasiti penjanaan daripada projek-projek yang mengalami kelewatan seperti LSS 1 dan LSS 2.

Usaha kerjasama serantau dalam pembekalan elektrik juga menunjukkan perkembangan positif apabila penghantaran tenaga dari Lao PDR ke Singapura dimulakan pada 23 Jun 2022 melalui *Lao PDR-Thailand-Malaysia-Singapore Power Integration Project* (LTMS-PIP), dengan kapasiti perdagangan kuasa sehingga 100 MW selama dua (2) tahun. Kerjasama bersejarah ini memberi ruang ke arah merealisasikan visi Grid Kuasa ASEAN (APG) yang lebih luas bagi perdagangan elektrik pelbagai hala melangkaui negara di rantau ini.

## Strengthening Energy Supply Security

*In ensuring the sustainable development of the country in the long term, the security of energy supply is a crucial aspect that is closely monitored by the Commission. With the increasing energy demand due to economic growth and evolving societal needs, various strategic measures appropriate for the transition towards cleaner energy have been outlined and acted upon.*

*Towards this objective, **the Government has maintained the target of achieving 31% of renewable energy (RE) capacity in Malaysia by 2025 and further increasing it to 40% by 2040.** In 2022, six (6) large-scale solar (LSS) projects were integrated into the system, with several more scheduled to be operational by the end of 2023.*

***As of 31 December 2022, the reserve margin in the Peninsula stands at 40%, compared to 42% in 2021.** This rate is expected to decrease to 36% in 2023 and further to the optimal reserve margin level of 20% by 2030. **Meanwhile, in Sabah, the reserve margin recorded a slight increase to 23%, compared to 19% in 2021.** However, this figure has not yet reached the optimal level of 30% due to the underperforming existing power plants and capacity constraints from delayed projects, namely LSS 1 and LSS 2.*

*Regional cooperation efforts in electricity supply have also shown positive progress as power transmission from Lao PDR to Singapore commenced on 23 June 2022, through the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP), with a power trading capacity of up to 100 MW for two (2) years. This historic collaboration paves the way towards realising the broader vision of the ASEAN Power Grid (APG) for multi-directional electricity trading across countries in the region.*



## Memastikan Daya Harap Pembekalan Tenaga dan Kualiti Perkhidmatan Industri

Dalam era globalisasi dan pertumbuhan ekonomi yang pesat, kestabilan bekalan tenaga dan kecekapan perkhidmatan industri menjadi aspek yang sangat penting bagi pembangunan ekonomi negara. ST telah melaksanakan pelbagai inisiatif untuk meningkatkan kualiti perkhidmatan industri, termasuk memastikan peningkatan teknologi dan infrastruktur, pembangunan kemahiran tenaga kerja, dan pengurangan gangguan dalam memastikan daya harap pembekalan tenaga.

**Jumlah kapasiti terpasang daripada penjanaan stesen jana kuasa di Semenanjung pada 2022 adalah sebanyak 27,620 MW**, dengan campuran kapasiti penjanaan yang terdiri daripada arang batu (43.9%), gas (43.2%), hidro (8.1%), solar (3.8%), dan lain-lain (1.0%). Walaupun terdapat penamatan beberapa loji jana kuasa, namun sistem grid kembali menerima penambahan kapasiti dengan pengoperasian beberapa LSS serta dua (2) blok loji jana kuasa Edra Energy Sdn. Bhd. **Di Sabah pula, kapasiti boleh harap meningkat kepada 1,268.1 MW** berbanding 1,176.34 MW pada 2021, didorong oleh pengoperasian semula beberapa loji jana kuasa seperti Stesen Jana Kuasa Serudong, Stesen Jana Kuasa Libaran dan TSH Biomass.

Dari segi prestasi daya harap sistem, **System Average Interruption Duration Index (SAIDI) bagi Semenanjung menunjukkan prestasi yang baik dengan catatan SAIDI sebanyak 45.06 minit/pelanggan/tahun pada 2022, berbanding 45.25 minit/pelanggan/tahun pada 2021. Di Sabah pula, tahap SAIDI berjaya mencapai sasaran yang ditetapkan dengan catatan 286.22 minit/pelanggan/tahun.**

Dari aspek kualiti kuasa **di Semenanjung pula, sebanyak 752 kejadian junaman voltan direkodkan berbanding 673 kejadian pada 2021. Pencapaian keseluruhan untuk Tahap Perkhidmatan yang Dijamin (GSL) pula adalah lebih tinggi iaitu sebanyak 99.73% berbanding 98.82% pada tahun sebelumnya.** Begitu juga dengan pencapaian keseluruhan **Tahap Perkhidmatan Minimum (MSL) yang meningkat kepada 97.31% daripada 96.79% pada 2021.** Hasil kajian Indeks Kepuasan Pelanggan TNB (CSI-TNB) pula

## Ensuring Reliability of Energy Supply and Service Quality of the Industry

*In the era of globalisation and rapid economic growth, the reliability of energy supply and service quality of the industry have become significant aspects of the country's economic development. The Commission has implemented various initiatives to enhance service quality, including improving technology and infrastructure, developing workforce skills, and reducing disruptions to ensure a reliable energy supply.*

**The total installed capacity of power generation stations in the Peninsula in 2022 was 27,620 MW**, with a generation capacity mix consisting of coal (43.9%), gas (43.2%), hydro (8.1%), solar (3.8%), and others (1.0%). Despite the decommissioning of some power plants, the grid received additional capacity through the operation of several LSS projects and two (2) blocks of Edra Energy Sdn. Bhd. power plants. **In Sabah, the dependable capacity increased to 1,268.1 MW** compared to 1,176.34 MW in 2021, driven by the re-operation of several power plants such as Serudong Power Plant, Libaran Power Plant, and TSH Biomass.

*In terms of the performance of the power system, the **System Average Interruption Duration Index (SAIDI) for the Peninsula showed good performance with a record of 45.06 minutes/customer/year in 2022, compared to 45.25 minutes/customer/year in 2021. In Sabah, the SAIDI level successfully reached the set target with a record of 286.22 minutes/customer/year.***

*In the aspect of power quality in the Peninsula, a total of **752 incidents of voltage sags were recorded** compared to 673 incidents in 2021. The overall achievement for the **Guaranteed Service Level (GSL) was higher at 99.73% compared to 98.82% in the previous year.** The overall achievement for the **Minimum Service Level (MSL) also increased to 97.31% compared to 96.79% in 2021.** The Tenaga Nasional Berhad (TNB) Customer Satisfaction Index (CSI-TNB) study recorded a score of 8.7, remaining unchanged from the score in 2021.*



merekodkan skor sebanyak 8.7, kekal tidak berubah berbanding skor pada 2021.

Bagi gas asli pula, jumlah pembekalan gas asli di Semenanjung oleh Petronas Energy and Gas Trading Sdn. Bhd. (PEGT) adalah sebanyak 621,911,178.42 MMBtu, Gas Malaysia Energy and Services Sdn. Bhd. (GMES) sebanyak 156,188,568.50 MMBtu, Shell Malaysia Trading Sdn. Bhd. (SHELL) sebanyak 4,436,091.00 MMBtu dan Petrolife Aero Sdn. Bhd. (PASB) adalah sebanyak 1,707,820.00 MMBtu. Pembekalan gas asli di Sabah dan Labuan pula adalah sebanyak 700,388.74 MMBtu.

## Meningkatkan Kecekapan Ekonomi dan Kemampuan

Keupayaan untuk mencapai kecekapan ekonomi yang tinggi dalam penjanaan, penghantaran, pengagihan dan penggunaan tenaga adalah kunci untuk memperkuatkan daya saing negara dan menjana pertumbuhan ekonomi yang lestari. Ia juga merupakan agenda penting bagi mengekalkan kestabilan bekalan tenaga di samping memenuhi keperluan dan kemampuan semasa dan jangka panjang masyarakat dan industri.

Dari segi penetapan tarif di bawah mekanisme Kawal Selia Berasaskan Insentif (IBR) bagi TNB di Semenanjung, setelah melanjutkan tempoh kawal selia kedua sehingga 2021, Kerajaan pada 5 Januari 2022 memutuskan untuk melaksanakan penetapan **kadar purata tarif asas elektrik baharu bagi tempoh RP3 iaitu sebanyak 39.95 sen/kWj. Di Sabah dan Labuan pula, pelaksanaan IBR secara penuh untuk tempoh RP1 bermula 1 Januari 2022 hingga 31 Disember 2024, dengan kadar purata tarif asas elektrik yang ditetapkan adalah pada 34.52 sen/kWj** sepertimana kadar tarif yang sama sejak 2014.

**Di Kawasan Perindustrian Kulim Hi-Tech Park (KHTP), Kerajaan menetapkan kadar purata tarif asas NUR Power Sdn. Bhd. (NUR) sebanyak 37.69 sen/kWj bagi tempoh RP2** bermula pada 1 Februari 2022 hingga 31 Disember 2024. Antara faktor utama yang menyumbang kepada peningkatan ini adalah semakan semula unjuran harga bahan api gas mengikut harga pasaran semasa dan pertambahan kos

*For natural gas, the total supply of natural gas in the Peninsula by Petronas Energy and Gas Trading Sdn. Bhd. (PEGT) was 621,911,178.42 MMBtu, Gas Malaysia Energy and Services Sdn. Bhd. (GMES) was 156,188,568.50 MMBtu, Shell Malaysia Trading Sdn. Bhd. (SHELL) was 4,436,091.00 MMBtu, and Petrolife Aero Sdn. Bhd. (PASB) was 1,707,820.00 MMBtu. The supply of natural gas in Sabah and Labuan was 700,388.74 MMBtu.*

## Enhancing Economic Efficiency and Capability

*The ability to achieve economic efficiency in power generation, transmission, distribution, and utilisation is key to strengthening the country's competitiveness and generating sustainable economic growth. It is also an important agenda for maintaining a stable energy supply while meeting the current and long-term needs and affordabilities of society and industries.*

*Regarding tariff setting under the Incentive-Based Regulation (IBR) mechanism for TNB in the Peninsula, after extending the second regulatory period until 2021, the Government decided, on 5 January 2022, to implement a **new average electricity base tariff rate for the RP3 period, which is 39.95 sen/kWh. In Sabah and Labuan, the full implementation of IBR for the RP1 period began on 1 January 2022 until 31 December 2024, with a set average electricity base tariff rate of 34.52 sen/kWh, which has remained the same since 2014.***

*In the Kulim Hi-Tech Park Industrial Area (KHTP), the Government set the average base tariff rate for NUR Power Sdn. Bhd. (NUR) at **37.69 sen/kWh for the RP2 period, which started on 1 February 2022 until 31 December 2024.** One of the main factors contributing to this increase is the review of gas fuel cost projection based on current market prices and the additional capital cost required to meet the quality infrastructure needs for electricity supply in KHTP.*





modal diperlukan untuk menampung keperluan kualiti infrastruktur pembekalan elektrik di KHTP.

Dari segi penetapan tarif bagi penggunaan kemudahan gas di bawah mekanisme IBR, penetapan purata tarif asas untuk RP1 berakhir pada 31 Disember 2022, setelah mula berkuat kuasa pada 1 Januari 2020. Di bawah mekanisme IBR juga, pemantauan ke atas prestasi pemegang lesen kemudahan gas terus dilaksanakan berdasarkan petunjuk-petunjuk prestasi yang telah ditetapkan. Bagaimanapun, tiada pemberian ganjaran atau penalti untuk RP1 memandangkan tempoh tersebut merupakan tempoh bagi menambah baik dan mengenal pasti kesesuaian penunjuk prestasi sebelum dilaksanakan sepenuhnya dalam RP2.

## Mempromosikan Kemampanan Tenaga

Di samping memastikan keberterusan bekalan tenaga serta kecekapan ekonomi dalam pembekalan tenaga, ST juga menetapkan kemampanan sebagai antara agenda utama dalam sektor tenaga negara. Ini kerana dalam usaha untuk mencapai pembangunan yang mampan, perhatian yang serius perlu turut diberikan kepada alam sekitar dan generasi masa depan.

Selaras dengan hasrat Kerajaan bagi mencapai sasaran kapasiti TBB sebanyak 31% bagi keseluruhan di Malaysia pada tahun 2025 dan 40% pada tahun 2040, beberapa inisiatif telah dirancang dan dilaksanakan. Ini termasuk Program Tenaga Hijau Korporat (CGPP) yang membolehkan syarikat-syarikat tempatan yang berhasrat untuk mengurangkan jejak karbon menggunakan TBB melalui pemasangan sistem solar fotovolt (PV). **Sejumlah 600 MW kapasiti telah ditawarkan melalui CGPP** di mana loji jana kuasa solar PV yang diluluskan untuk program ini hendaklah mula beroperasi tidak lewat dari 2025.

**Pelaksanaan Program Bidaan Loji Solar Fotovolt Berskala Besar juga diteruskan di mana daripada 30 projek yang dianugerahkan dalam bidaan LSS@MEntARI, 23 projek telah mencapai *Financial Close***, bermakna urusan kewangan dengan pihak perbankan telah diselesaikan. Beberapa projek juga telah mencapai pelaksanaan lebih 80% dan dijangka siap mengikut tarikh *Scheduled Commercial Operation Date* (SCOD) yang ditetapkan.

*Regarding tariff setting for the use of gas facilities under the IBR mechanism, the average base tariff rate for RP1 ended on 31 December 2022, after coming into effect from 1 January 2020. Under the IBR mechanism, monitoring of the performance of gas facility licensees continues based on established performance indicators. However, no rewards or penalties were given for RP1, as it was a period for improvement and identifying the suitability of performance indicators before full implementation in RP2.*

## Promoting Energy Sustainability

*Apart from ensuring energy supply security and economic efficiency in energy supply, the Commission also places sustainability as a key agenda in the country's energy sector. This is because, in the pursuit of sustainable development, serious attention must be given to the environment and future generations.*

*In line with the Government's aspiration to achieve a total RE capacity of 31% in Malaysia by 2025 and 40% by 2040, several initiatives have been planned and implemented. These include the Corporate Green Power Purchase Programme (CGPP), which enables local companies aiming to reduce their carbon footprint to use RE through the installation of photovoltaic (PV) solar systems. **A total of 600 MW capacity has been offered through CGPP**, and PV solar power plants approved for this programme must begin operating no later than 2025.*

***The implementation of the Large Scale Solar Photovoltaic Plant Bidding Programme is also ongoing, where out of 30 projects awarded in the LSS@MEntARI bidding, 23 projects have achieved *Financial Close***, in which financial arrangements with banking institutions have been completed. Several projects have also reached over 80% completion and are expected to be completed according to the Scheduled Commercial Operation Date (SCOD) set.*

**LSS@MEntARI Bidding**  
LSS@MEntARI Bidding

**23** projek telah mencapai ***Financial Close***  
projects have achieved *Financial Close*

Mekanisme *Net Energy Metering* (NEM) pula membolehkan pengguna menjana elektrik daripada sumber TBB seperti solar di mana pengguna akan menggunakan tenaga tersebut untuk kegunaan sendiri (*self-consumption*) sebelum dijual ke Grid. Sehingga Disember 2022, **permohonan NEM 3.0 yang diluluskan berjumlah 522.06 MW manakala yang telah beroperasi pula berjumlah 293.43 MW.**

Kemampuan tenaga juga melibatkan kesedaran dan penyertaan masyarakat dalam penggunaan tenaga yang bijak. Peningkatan kefahaman rakyat terhadap kepentingan penggunaan tenaga secara berhemah dapat dilihat melalui **pengurangan intensiti tenaga elektrik, iaitu 2.2% untuk Semenanjung dan 1.7% untuk Sabah.** Pelaksanaan Pelan Tindakan Kecekapan Tenaga Nasional (NEEAP) pula menyaksikan pencapaian **penjimatan tenaga elektrik sebanyak 5.78% berbanding jangkaan sasaran iaitu 5.0%.**

Sebagai kesinambungan kepada Program *Sustainability Achieved Via Energy Efficiency* (SAVE) 1.0 dan 2.0 yang dilaksanakan pada 2011 dan 2021, Program SAVE 3.0 diteruskan pada 2022 dengan menawarkan e-rebat kepada pengguna kategori domestik untuk pembelian peralatan elektrik berlabel cekap tenaga empat (4) atau lima (5) bintang. Program ini telah menyaksikan **penjimatan tenaga sebanyak 110.7 GWj setahun.**

## Menambah Baik Kualiti Kawal Selia dan Pelaksanaan Perkhidmatan

Kualiti kawal selia dan pelaksanaan perkhidmatan merupakan komponen penting bagi kejayaan sesuatu organisasi, dan ST sentiasa memberi keutamaan kepada pengurusan dan pemantauan proses secara efisien dari semasa ke semasa. Bagi menambah baik Sistem Pengurusan Kualiti (SPK) ST dan memastikan proses kerja di ST memenuhi keperluan standard ISO 9001:2015, audit pemantauan kedua telah dijalankan yang membolehkan **ST menerima Pensijilan dari Lloyds Register Quality Assurance (LRQA).** Kejayaan ini menunjukkan SPK di ST telah mengikuti pendekatan yang diiktiraf di peringkat global.

Projek Transformasi Digital ST juga diteruskan bagi meningkatkan prestasi penyampaian perkhidmatan sistem dalam talian untuk pemegang taruh ST. Hasil

*The Net Energy Metering (NEM) mechanism allows users to generate electricity from RE sources such as solar, which they use for self-consumption before selling the excess to the grid. As of December 2022, **approved NEM 3.0 applications amounted to 522.06 MW, while the operational capacity was 293.43 MW.***

*Energy sustainability also involves raising awareness and involving the public in using energy wisely. The increase in the public's understanding of the importance of efficient consumption can be seen through the **reduction of electricity intensity, which was 2.2% for the Peninsula and 1.7% for Sabah.** The implementation of the National Energy Efficiency Action Plan (NEEAP) has achieved an **electricity saving of 5.78%, surpassing the target of 5.0%.***

*As an extension of the Sustainability Achieved Via Energy Efficiency (SAVE) 1.0 and 2.0 programmes implemented in 2011 and 2021, the SAVE 3.0 Programme was continued in 2022, offering e-rebates to domestic consumers for the purchase of energy-efficient appliances labelled with four (4) or five (5) stars. This programme has achieved **energy savings of 110.7 GWh per year.***

## Improvement of Regulatory Quality and Service Delivery

*Regulatory quality and service delivery are crucial components for the success of any organisation, and the Commission always prioritises efficient management and monitoring of processes from time to time. To improve the Commission's Quality Management System (QMS) and ensure that the Commission's work processes meet the requirements of the ISO 9001:2015 standard, second surveillance audit has been conducted, enabling the **Commission to attain certification from Lloyds Register Quality Assurance (LRQA).** This achievement demonstrates that the Commission's QMS follows globally recognised approaches.*

*The Commission Digital Transformation Project is also continued to enhance the performance of online service delivery for the Commission's stakeholders. The results of the Business Process Reengineering (BPR) study have been used to prepare the User Requirements Specification (URS) for the development of the new Integrated System. Throughout 2022, URS activities have been initiated with*

kajian *Business Process Reengineering* (BPR) telah digunakan untuk menyediakan Spesifikasi Keperluan Pengguna (URS) bagi pembangunan Sistem Bersepadu ST yang baharu. Sepanjang 2022, aktiviti URS telah dimulakan dengan memberitumpuan kepada keperluan Sistem Bersepadu ST yang akan menggantikan sistem *Energy Commission Online System* (ECOS) dan *Online Application System* (OAS) ST.

Sebagai persediaan industri untuk menghadapi cabaran ekoran kemunculan teknologi disruptif, ST telah melaksanakan **Kajian Semula dan Pindaan kepada Akta 447 dan Akta 610 bagi mengenal pasti kelemahan dan kelompangan dalam pelaksanaan atau pemakaian peruntukan sedia ada**. Pindaan substantif juga telah dicadangkan melalui pengubalan kepada Peraturan-Peraturan Elektrik (Pindaan) 2022, Peraturan-Peraturan Bekalan Pemegang Lesen (Pindaan) 2022 dan Peraturan-Peraturan Bekalan Gas (Pindaan) 2022, bagi memastikan undang-undang pembekalan tenaga sentiasa ditambah baik dan dikemas kini mengikut peredaran masa dan perkembangan industri bekalan elektrik secara khususnya. Rang Undang-Undang Kecekapan dan Konservasi Tenaga 2022 juga sedang di peringkat semakan Jabatan Peguam Negara dan dijangka akan dibentangkan di Parlimen pada 2023.

Perhatian juga diberikan terhadap pengurusan aduan yang menjadi saluran utama komunikasi terus dengan pengguna tenaga. Sepanjang 2022, **ST menerima sebanyak 1,019 aduan, pengurangan 33% berbanding 1,523 aduan pada tahun sebelumnya**. Daripada jumlah ini, **sebanyak 935 atau 92.3% aduan telah diselesaikan pada akhir Disember 2022**.

## Pembangunan Kapasiti dan Keupayaan

Bagi membolehkan ST menjalankan tugas dengan efektif, pembangunan kapasiti dan keupayaan turut dititikberatkan. Pada 2022, **ST mempunyai seramai 377 warga kerja yang terdiri dari 53% kakitangan lelaki dan 47% kakitangan wanita dari pelbagai latar belakang pendidikan dan pengalaman**, bagi menjalankan tugas-tugas yang ditetapkan. Program-program pembangunan dalaman seperti kursus kepimpinan, kursus kemahiran berkomunikasi dan lain-lain bidang kemahiran untuk kakitangan Eksekutif

*a focus on the requirements of the Integrated System, which will replace the Energy Commission Online System (ECOS) and the ST Online Application System (OAS).*

*As part of the industry's preparation to face challenges arising from the emergence of disruptive technologies, the Commission has undertaken a **Review and Amendment of Act 447 and Act 610 to identify weaknesses and gaps in the implementation or use of existing provisions**. Substantive amendments have also been proposed through the drafting of the Electricity Regulations (Amendment) 2022, Licensee Supply Regulations (Amendment) 2022, and Gas Supply Regulations (Amendment) 2022, to ensure that energy supply laws are continually improved and updated to match the evolving trends and developments in the power supply industry, in particular. The Energy Efficiency and Conservation Bill 2022 is also under review by the Attorney General's Chambers and is expected to be presented in Parliament in 2023.*

*Attention is also given to the management of complaints, which serve as the main channel of direct communication with energy consumers. Throughout 2022, **the Commission received a total of 1,019 complaints, a 33% reduction compared to the 1,523 complaints received in the previous year**. Of this total, **935 or 92.3% of the complaints were resolved by the end of December 2022**.*

## Capacity and Capability Building

*To enable the Commission to carry out its duties effectively, capacity and capability building is also emphasised. In 2022, the **Commission had a total of 377 employees, comprising 53% male and 47% female staff, from various educational and experiential backgrounds**, to fulfil their assigned tasks. Internal development programmes, such as leadership courses, communication skills courses, and other skill-building programmes for executive and support staff, were continued, with a total of 243 courses conducted, including 57 sessions of Coaching and Mentoring by Subject Matter Experts.*

dan kakitangan sokongan juga diteruskan, di mana sejumlah 243 kursus telah dilaksanakan, termasuklah 57 sesi *Coaching and Mentoring* oleh *Subject Matter Experts*.

Selain itu, beberapa *ST Lecture Series* dan Sesi Damping Pejabat Kawasan & Klinik Undang-Undang turut diadakan bagi meningkatkan kesedaran undang-undang di kalangan warga ST. Langkah-langkah ini dijangka dapat menambah ilmu pengetahuan dan mempersiapkan warga ST bagi menghadapi cabaran-cabaran dalam menjalankan tugas masing-masing.

Pada 2022 juga, *Corporate House* ST yang baharu telah diluluskan, bertujuan untuk terus memperkembangkan fokus warga kerja dan pihak berkepentingan terhadap sasaran strategik, pelaksanaan kawal selia dan kualiti perkhidmatan ST. **Corporate House 2022 ini menekankan Teras Strategik Kemampanan Tenaga yang berdiri sendiri, untuk mempamerkan komitmen ST terhadap agenda Net Zero Emission 2050.** Susunan Teras-teras Strategik bagi *Corporate House* 2022 juga turut dirombak agar selaras dengan Misi ST.

Sehubungan itu, reka bentuk muka hadapan Laporan Tahunan ST 2022 dan laporan-laporan akan datang didedikasikan untuk fungsi dan skop bagi setiap Teras Strategik dan Pemboleh Upaya *Corporate House* 2022 agar semua pemegang taruh dan pembaca dapat turut serta dalam perjalanan masa hadapan kami.

Pada masa sama, saya juga ingin mengucapkan setinggi-tinggi penghargaan kepada semua warga kerja ST kerana melaksanakan tugas masing-masing dengan dedikasi, bertanggungjawab dan berintegriti, dalam memberikan perkhidmatan terbaik kepada semua pemegang taruh ST. Saya juga berharap prestasi ini dapat dikekalkan malah ditambah baik dari semasa ke semasa bagi merealisasikan visi ST sebagai badan kawal selia tenaga bertaraf dunia.

Terima kasih dan salam hormat.

## DATO' IR. TS. ABDUL RAZIB DAWOOD

Ketua Pegawai Eksekutif Suruhanjaya Tenaga  
*Chief Executive Officer of the Energy Commission*

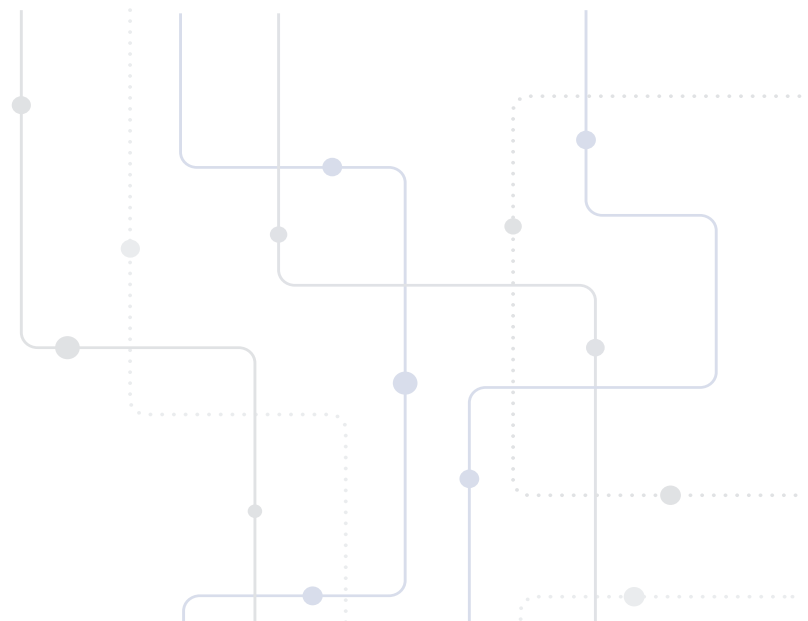
*Additionally, several ST Lecture Series and Regional Office Shadowing & Legal Clinic Sessions were organised to enhance legal awareness among the Commission's employees. These measures are expected to enhance knowledge and prepare the Commission's employees to face challenges in their respective roles.*

*In 2022, a new Corporate House for the Commission was approved, aimed at strengthening the focus of employees and stakeholders on the Commission's strategic goals, regulatory implementation, and service quality. **The Corporate House 2022 emphasised the Sustainable Energy Strategic Pillar, standing independently, to demonstrate the Commission's commitment to the Net Zero Emission 2050 agenda.** The arrangement of Strategic Pillars for Corporate House 2022 was also restructured to align with the Commission's Mission.*

*Therefore, the design of the front cover of the Commission's 2022 Annual Report and future reports is dedicated to the functions and scopes of each Strategic Pillar and Enabler of Corporate House 2022 so that all stakeholders and readers can participate in our future journey.*

*At the same time, I would like to express my highest appreciation to the Commission's employees for carrying out their duties with dedication, responsibility, and integrity in providing the best service to all stakeholders of the Commission. I also hope that this performance can be maintained and even improved over time to realise the Commission's vision as a world-class energy regulatory body.*

*Thank you and best regards.*





# Maklumat Utama

## Key Information

### Keselamatan dan Penguatkuasaan Safety and Enforcement



#### Kemalangan Elektrik Electrical Accidents

**58** Kes  
Cases



#### Kemalangan Gas Berpaip Piped Gas Accidents

**1** Kes  
Case

#### Lokasi Utama Kemalangan Main Locations of Accidents

- Elektrik / Electrical**
  - Talian Atas Voltan Rendah / Low Voltage Overhead Lines
  - Kawasan Kediaman / Residential Areas
  - Talian Atas Voltan Tinggi / High Voltage Overhead Lines
- Gas Berpaip / Piped Gas**
  - Dobi / Launderette

#### Punca Utama Kemalangan Main Causes of Accidents

- Elektrik / Electrical**
  - Pemasangan / Senggaraan Tidak Sempurna  
Improper Installation / Maintenance
  - Prosedur Kerja Selamat Tidak Dipatuhi  
Non-Compliance With Safe Work Procedures
  - Aktiviti Orang Awam Berhampiran Pemasangan Elektrik  
Public Activities Near Electrical Installations
- Gas Berpaip / Piped Gas**
  - Pemasangan / Senggaraan Tidak Sempurna  
Improper Installation / Maintenance

#### Kertas Siasatan Investigation Papers

**Kertas Siasatan Dirujuk ke  
Jabatan Peguam Negara**  
Investigation Papers Referred to  
the Attorney General's Chamber

**510**  
Kertas Siasatan  
Investigation Papers

**Kompaun**  
Compounds

**83**

**Kompaun Yang  
Telah Dibayar**  
Compound Paid

**RM206,500**

#### Pelesenan Licensing

<b>902</b> Lesen Elektrik Electricity Licences	<b>3,554</b> Lesen Gas Persendirian Private Gas Licences
<b>46</b> Lesen Berkaitan Akses Pihak Ketiga TPA Related Licences	<b>779</b> Lesen Gas Peruncitan Gas Retail Licences

#### Perakuan Kekompetenan dan Kontraktor Competency Certification and Contractors

- Perakuan Kekompetenan Elektrik**  
Electrical Competency Certification  
**5,156** Perakuan / Certificates
- Perakuan Kekompetenan Gas**  
Gas Competency Certification  
**44** Perakuan / Certificates
- Pendaftaran Kontraktor Elektrik**  
Electrical Contractors Registration  
**1,051** Kontraktor / Contractors
- Pendaftaran Kontraktor Gas**  
Gas Contractors Registration  
**121** Kontraktor / Contractors
- Institusi Ditauihkan untuk Mengendali  
Peperiksaan Kekompetenan Elektrik**  
Accredited Institutions Facilitating  
Electrical Competency Examinations  
**15** Institusi / Institutions
- Institusi Ditauihkan untuk Mengendali  
Peperiksaan Kekompetenan Gas**  
Accredited Institutions Facilitating  
Gas Competency Examinations  
**0** Institusi / Institutions

#### Perakuan Kelulusan / Perakuan Pendaftaran Kelengkapan Equipment Certificate of Approval / Registration

**Perakuan Kelulusan  
Kelengkapan Elektrik**  
Electrical Equipment COA

- 10,768 Baharu / New
- 6,287 Pembaharuan / Renewals

Pengilang (34 Baharu & 95  
Pembaharuan) dan Pengimport  
(226 Baharu & 411 Pembaharuan)  
Manufacturers (34 New & 95  
Renewals) and Importers (226 New  
& 411 Renewals)

**Perakuan Pendaftaran  
Pengilang dan Pengimport  
Kelengkapan Elektrik**  
Certificate of Registration For  
Manufacturers and Importers

**Perakuan Kelulusan Gegasan  
Gas, Perkakas Gas dan  
Kelengkapan**  
Gas Fittings, Gas Appliances  
and Equipment COA

- 1,302 Perakuan Kelulusan /  
COA

176 Perakuan Kelulusan /  
COA

**Perakuan Kelulusan  
Pengilang / Pemasang dan  
Pengimport Gas**  
Gas COA for Manufacturers,  
Assemblers and Importers

**ATI dan / and ATO**

- 2,017 ATI dan 1,865 ATO  
2,017 ATI and 1,865 ATO

## Keberterusan Bekalan Tenaga Energy Security

### Loji Jana Kuasa / Power Plants

Semenanjung  
The Peninsula

7 8 15 44



### Campuran Kapasiti Terpasang Installed Capacity Mix

Semenanjung  
The Peninsula

18% 38% 44%



### Campuran Tenaga Energy Mix

Semenanjung  
The Peninsula

7% 39% 54%



### Shipper Baharu Pasaran Pengagihan Gas New Shippers for Gas Distribution Market

- Petronas Energy and Gas Trading Sdn. Bhd.
- Shell Malaysia Trading Sdn. Bhd.
- Petrolife Aero Sdn. Bhd.

Solar Berskala Besar / LSS   Gas   Arang Batu / Coal   Hidro Hydro   TBB RE

## Daya Harap Pembekalan Tenaga dan Kualiti Perkhidmatan Energy Supply Reliability and Service Quality

### Permintaan dan Pembekalan Demand and Supply

Jumlah Tenaga  
Energy Total

130,625 GWj / GWh  
Permintaan Puncak  
Peak Demand

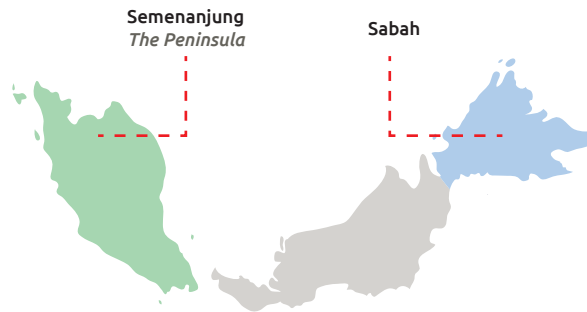
19,183 MW (24 Mei / May)

Kapasiti Terpasang  
Installed Capacity

27,620 MW

Margin Rizab  
Reserve Margin

40%



Jumlah Tenaga  
Energy Total

6,911.9 GWj / GWh  
Permintaan Puncak  
Peak Demand

1,032.1 MW (11 Ogos / August)

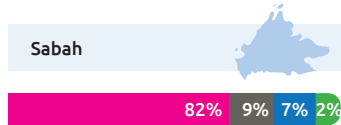
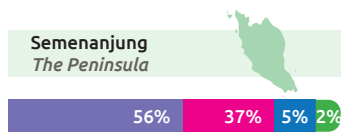
Kapasiti Terpasang  
Installed Capacity

1,551.4 MW

Margin Rizab  
Reserve Margin

23%

### Campuran Penjana Generation Mix



Arang Batu / Coal   Diesel  
Lain-lain / Others   Hidro / Hydro  
Gas

### Pembekalan Gas Asli Natural Gas Supply

**PEGT**  
621,911,178.42 MMBtu

**GMES**  
156,188,568.50 MMBtu

**SHELL**  
4,436,091.00 MMBtu

**PASB**  
1,707,820.00 MMBtu

**SEC**  
700,388.74 MMBtu

### SAIDI Elektrik Electricity SAIDI

Semenanjung  
The Peninsula  
**45.06**  
minit/pelanggan/tahun  
minutes/customer/year

Sabah  
**286.22**  
minit/pelanggan/tahun  
minutes/customer/year

### SAIDI Gas Berpaip Piped Gas SAIDI

Semenanjung  
The Peninsula  
**0** minit/pelanggan/tahun  
minutes/customer/year

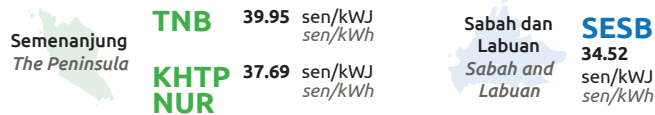
### Pematuhan GSL dan MSL GSL and MSL Compliance

**G** **GSL**  
99.73%

**M** **MSL**  
97.31%

## Kecekapan Ekonomi dan Kemampuan Economic Efficiency and Affordability

### Kadar Purata Tarif Asas Elektrik Average Base Electricity Tariff Rate

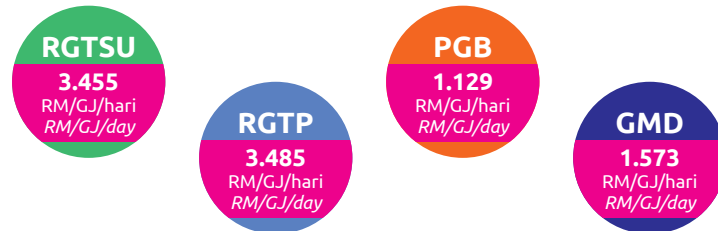


### Loji Jana Kuasa yang Menyertai NEDA Power Plants Participating NEDA



**1** 29.9 MW

### Purata Tarif Asas Bagi Penggunaan Kemudahan Gas Average Base Tariff for the Usage of Gas Facilities



### Pecahan Langganan GET Breakdown of GET Subscriptions



### Jumlah Pengguna yang Melanggan GET Total Subscribers of GET

**2,035**

## Kemampuan Tenaga Energy Sustainability

### Jumlah Kapasiti NEM 3.0 yang Telah Dimohon Total Capacity of NEM 3.0 Applied

NEM Rakyat  
**60.43 MW**

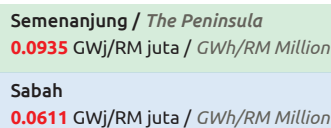
NEM GoMEn  
**30.06 MW**

NEM NOVA  
**462.41 MW**

### Kapasiti Ditawarkan Melalui CGPP Capacity Offered through CGPP

**600 MW**

### Intensiti Tenaga Elektrik Electricity Intensity



### Penggunaan Tenaga Elektrik Electricity Consumption



### Penjimatan Elektrik NEEAP NEEAP Electricity Savings

**5.78%** (8,281 GWj / GWh)  
(RM2.035 billion / billion)

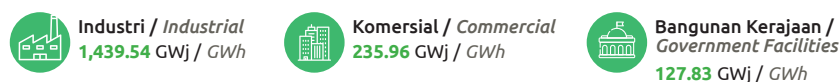
### Pematuhan PPTEC PPTEC Compliance

**78%** (1,520 Pemasangan / Installations)

### Penjimatan Program SAVE 3.0 SAVE 3.0 Programme Savings

**110.7**  
GWj / GWh

### Penjimatan Tenaga Tahunan PPTEC PPTEC Annual Energy Savings



## Kualiti Kawal Selia dan Pelaksanaan Perkhidmatan Regulatory Quality and Service Delivery

### Pengurusan Aduan Complaints Management

Diterima / Received

**1,019**  
Aduan / Complaints

Diselesaikan / Resolved

**935**  
Aduan / Complaints

### Tahap Kepuasan Pelanggan ST The Commission's CSI



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# Visi

## Vision

### Ke Arah Sebuah Badan Kawal Selia Tenaga Bertaraf Dunia Menjelang 2026

*Towards A World Class Energy Regulator by 2026*



# Misi

## Mission

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

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

# Nilai Teras

## Core Values



**Kecemerlangan**

*Excellence*



**Profesionalisme**

*Professionalism*



**Integriti**

*Integrity*



**Ketulusan dan Kesaksamaan**

*Sense of Fairness and Fairplay*

# Mengenai Suruhanjaya Tenaga

## About the Energy Commission

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001, Suruhanjaya Tenaga (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 (3) iaitu Kawal Selia Ekonomi, Kawal Selia Teknikal dan Peraturan Keselamatan.

*A statutory body established under the Energy Commission Act 2001, the Energy Commission (the Commission) is responsible for regulating the energy sector, specifically the electricity and piped gas supply industries in the Peninsula and Sabah.*

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

*The roles of the Commission are divided into three (3), 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 keselamatan, 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 dari bahaya yang timbul dari 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*

Suruhanjaya Tenaga hendaklah mempunyai segala fungsi yang dipertanggungjawabkan ke atasnya di bawah undang-undang pembekalan tenaga dan hendaklah juga mempunyai fungsi-fungsi yang berikut:

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

- **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.*

- **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.*

- **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.*

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

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

- **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.*

- **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.*

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

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

# Anggota Suruhanjaya Tenaga

## Energy Commission Members

**DATO' AZIAN OSMAN**

Pengerusi  
*Chairman*

**DATO' MOHAMAD RAZIF  
HAJI ABD MUBIN**

Dilantik pada 20 April 2022  
*Appointed on 20 April 2022*

**TUAN MOHD SUKRI  
MAT JUSOH**

Dilantik pada 1 Februari 2022  
*Appointed on 1 February 2022*

**DATO' IR. TS. ABDUL  
RAZIB DAWOOD**

Ketua Pegawai Eksekutif  
*Chief Executive Officer*

**DATO' ANIS RIZANA  
MOHD ZAINUDIN @  
MOHD ZAINUDDIN**

**DATO' IR. DR. SHAIK  
HUSSEIN MYDIN**





**DATUK ADNAN SEMAN  
@ ABDULLAH**

**YB SENATOR IR.  
TS. KHAIRIL NIZAM  
KHIRUDIN**

**PUAN NOOR AFIFAH  
ABDUL RAZAK**

Tamat Perkhidmatan pada 1 Mac 2022  
*Concluded Service on 1 March 2022*

**DATO' DR.  
HALIM MAN**

**PUAN ZAEIDAH  
MOHAMED ESA**

Tamat Perkhidmatan pada  
31 Januari 2022  
*Concluded Service on  
31 January 2022*

**DATO' AHMAD NAZIM  
ABD RAHMAN**

Tamat Perkhidmatan pada  
13 Mei 2022  
*Concluded Service on  
13 May 2022*



# Mesyuarat Suruhanjaya Tenaga 2022

## Energy Commission Meetings 2022

Anggota Suruhanjaya Tenaga telah bermesyuarat sebanyak 12 kali sepanjang 2022 bagi memastikan tugas dan fungsi kawal selia aktiviti pembekalan tenaga dilaksanakan mengikut kehendak undang-undang. Mesyuarat Khas Suruhanjaya Tenaga juga telah diadakan sebanyak empat (4) kali pada 2022.

Suruhanjaya Tenaga mempunyai lima (5) Jawatankuasa, iaitu Jawatankuasa Bersama Pelesenan (Pengurusan dan Suruhanjaya Tenaga), Jawatankuasa Kewangan dan Tender, Jawatankuasa Audit, Jawatankuasa Integriti serta Jawatankuasa Teknikal.

*The Commission Members convened for a total of 12 meetings in 2022 to ensure the roles and functions of regulating energy supply activities are carried out in accordance with the requirement of the law. The Energy Commission Special Meetings were also held four (4) times in 2022.*

*The Commission has five (5) Committees which include the Licensing Committee (Management and the Commission), the Financial and Tender Committee, the Audit Committee, the Integrity Committee, and the Technical Committee.*

### Jumlah Mesyuarat Suruhanjaya Tenaga dan Jawatankuasa Suruhanjaya Tenaga 2022 Total of Energy Commission and Energy Commission Committees' Meetings 2022

Mesyuarat Meetings	Bilangan Mesyuarat Number of Meetings
Mesyuarat Suruhanjaya Tenaga <i>Energy Commission Meetings</i>	12
Mesyuarat Khas Suruhanjaya Tenaga <i>Energy Commission Special Meetings</i>	4
Mesyuarat Jawatankuasa Bersama Pelesenan (Pengurusan dan Suruhanjaya Tenaga) <i>Energy Commission Licensing Committee (Management and the Commission) Meetings</i>	16
Mesyuarat Jawatankuasa Kewangan dan Tender Suruhanjaya Tenaga <i>Energy Commission Financial and Tender Committee Meetings</i>	7
Mesyuarat Jawatankuasa Audit Suruhanjaya Tenaga <i>Energy Commission Audit Committee Meetings</i>	4
Mesyuarat Jawatankuasa Integriti Suruhanjaya Tenaga <i>Energy Commission Integrity Committee Meetings</i>	2
Mesyuarat Jawatankuasa Teknikal Suruhanjaya Tenaga <i>Energy Commission Technical Committee Meetings</i>	2



### Mesyuarat Suruhanjaya Tenaga

Energy Commission Meetings

2022

JANUARI  
JANUARY

25

FEBRUARI  
FEBRUARY

24

MAC  
MARCH

24

APRIL  
APRIL

26

MEI  
MAY

25

JUN  
JUNE

22

JULAI  
JULY

28

OGOS  
AUGUST

26

SEPTEMBER  
SEPTEMBER

22

OKTOBER  
OCTOBER

20

NOVEMBER  
NOVEMBER

29

DISEMBER  
DECEMBER

15

### Mesyuarat Khas Suruhanjaya Tenaga

Energy Commission Special Meetings

2022

JANUARI  
JANUARY

20

FEBRUARI  
FEBRUARY

-

MAC  
MARCH

-

APRIL  
APRIL

-

MEI  
MAY

-

JUN  
JUNE

-

JULAI  
JULY

14

OGOS  
AUGUST

-

SEPTEMBER  
SEPTEMBER

8 & 28

OKTOBER  
OCTOBER

-

NOVEMBER  
NOVEMBER

-

DISEMBER  
DECEMBER

-

### Mesyuarat Jawatankuasa Bersama Pelesenan (Pengurusan Dan Suruhanjaya Tenaga) (JKBP)

Licensing Committee Meetings (Management and the Energy Commission)

2022

JANUARI  
JANUARY

20

FEBRUARI  
FEBRUARY

15 & 22

MAC  
MARCH

23

APRIL  
APRIL

20

MEI  
MAY

24

JUN  
JUNE

16 & 21

JULAI  
JULY

19 & 21

OGOS  
AUGUST

16 & 18

SEPTEMBER  
SEPTEMBER

28

OKTOBER  
OCTOBER

13

NOVEMBER  
NOVEMBER

24

DISEMBER  
DECEMBER

14

### Mesyuarat Jawatankuasa Kewangan dan Tender Suruhanjaya Tenaga (JKKT)

Energy Commission Financial Committee and Tender Meetings

2022

JANUARI  
JANUARY

20

FEBRUARI  
FEBRUARY

16

MAC  
MARCH

16

APRIL  
APRIL

-

MEI  
MAY

-

JUN  
JUNE

16

JULAI  
JULY

21

OGOS  
AUGUST

24

SEPTEMBER  
SEPTEMBER

-

OKTOBER  
OCTOBER

-

NOVEMBER  
NOVEMBER

-

DISEMBER  
DECEMBER

13

**Mesyuarat Jawatankuasa Audit Suruhanjaya Tenaga (JKA)**

*Energy Commission Audit Committee Meetings*

**2022**

<b>JANUARI</b> JANUARY ----- <b>24</b>	<b>FEBRUARI</b> FEBRUARY ----- -	<b>MAC</b> MARCH ----- -	<b>APRIL</b> APRIL ----- <b>12</b>	<b>MEI</b> MAY ----- -	<b>JUN</b> JUNE ----- -
<b>JULAI</b> JULY ----- -	<b>OGOS</b> AUGUST ----- <b>22</b>	<b>SEPTEMBER</b> SEPTEMBER ----- -	<b>OKTOBER</b> OCTOBER ----- -	<b>NOVEMBER</b> NOVEMBER ----- -	<b>DISEMBER</b> DECEMBER ----- <b>12</b>

**Mesyuarat Jawatankuasa Integriti Suruhanjaya Tenaga (JKI)**

*Energy Commission Integrity Committee Meetings*

**2022**

<b>JANUARI</b> JANUARY ----- -	<b>FEBRUARI</b> FEBRUARY ----- -	<b>MAC</b> MARCH ----- -	<b>APRIL</b> APRIL ----- -	<b>MEI</b> MAY ----- -	<b>JUN</b> JUNE ----- -
<b>JULAI</b> JULY ----- -	<b>OGOS</b> AUGUST ----- <b>22</b>	<b>SEPTEMBER</b> SEPTEMBER ----- -	<b>OKTOBER</b> OCTOBER ----- -	<b>NOVEMBER</b> NOVEMBER ----- -	<b>DISEMBER</b> DECEMBER ----- <b>12</b>

**Mesyuarat Jawatankuasa Teknikal Suruhanjaya Tenaga (JKT)**

*Energy Commission Technical Committee Meetings*

**2022**

<b>JANUARI</b> JANUARY ----- -	<b>FEBRUARI</b> FEBRUARY ----- <b>16</b>	<b>MAC</b> MARCH ----- -	<b>APRIL</b> APRIL ----- -	<b>MEI</b> MAY ----- -	<b>JUN</b> JUNE ----- -
<b>JULAI</b> JULY ----- -	<b>OGOS</b> AUGUST ----- -	<b>SEPTEMBER</b> SEPTEMBER ----- -	<b>OKTOBER</b> OCTOBER ----- -	<b>NOVEMBER</b> NOVEMBER ----- -	<b>DISEMBER</b> DECEMBER ----- <b>14</b>



# Corporate House Suruhanjaya Tenaga

## Corporate House of the Energy Commission

**VISI**  
Vision

**Ke Arah Sebuah Badan Kawal Selia Tenaga Bertaraf Dunia Menjelang 2026**

*Towards A World Class Energy Regulator by 2026*

**MISI**  
Mission

**Suruhanjaya Tenaga berazam untuk mengimbangi keperluan pengguna dan pembekal tenaga bagi memastikan pembekalan yang selamat, berterusan, dan berdaya harap, meningkatkan kecekapan ekonomi dan kemampuan, melindungi kepentingan awam, dan menggalakkan pembangunan ekonomi dan pasaran kompetitif dalam persekitaran yang lestari.**

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

**5 TERAS STRATEGIK**  
5 STRATEGIC PILLARS

**Keselamatan**  
*Safety*

**Keberterusan Bekalan Tenaga**  
*Energy Security*

**Daya Harap Pembekalan Tenaga dan Kualiti Perkhidmatan**  
*Energy Reliable Supply and Service Quality*

**Kecekapan Ekonomi dan Kemampuan**  
*Economic Efficiency and Affordability*

**Kemampuan Tenaga**  
*Energy Sustainability*

**SASARAN GOAL**

**Melindungi pengguna dan industri dari bahaya yang timbul dari aktiviti berkaitan pembekalan elektrik dan gas berpaip.**  
*To protect the public and industries from the dangers arising from the activities related to the supply of electricity and piped gas.*

**Memastikan keberterusan bekalan tenaga bagi memenuhi permintaan semasa dan masa hadapan.**  
*To ensure security of energy supply to meet current and future demand.*

**Memastikan pembekalan yang berdaya harap dengan kualiti perkhidmatan yang cemerlang.**  
*To ensure continuous supply with excellent service quality.*

**Memastikan kecekapan ekonomi industri elektrik dan gas berpaip di samping mempromosikan industri yang adil, cekap dan telus.**  
*To ensure both the electricity and piped gas industries are economically efficient while promoting a fair, efficient, and transparent industry.*

**Memastikan kemampuan bekalan tenaga untuk generasi akan datang dan berpegang teguh kepada amalan tadbir urus yang baik.**  
*To ensure sustainable energy for future generation and upholding good governance.*

**2 PEMOLEH UPAYA**  
2 ENABLERS

**Kualiti Kawal Selia dan Pelaksanaan Perkhidmatan**  
*Regulatory Quality and Service Delivery*

**Pembangunan Kapasiti dan Keupayaan**  
*Capacity and Capability Building*

**SASARAN GOAL**

**Mempertingkatkan kepercayaan pemegang taruh dengan pengukuhan rangka kerja kawal selia secara berterusan dan penyediaan penyampaian perkhidmatan yang cekap.**  
*To enhance stakeholders' trust by continuously strengthening regulatory framework and provide efficient service delivery.*

**Mempunyai tenaga kerja dengan kompetensi, keupayaan, motivasi dan keterlibatan di tahap tinggi.**  
*To have highly competent, capable, motivated and engaged staff.*

# Pengurusan Tertinggi

## Management Team

**Barisan hadapan (dari kiri ke kanan)**  
*Front row (from left to right)*

**MOHD ELMI ANAS**

Pengarah Penguatkuasaan dan Operasi Kawasan  
*Director of Enforcement and Regional Operations*

**DATO' IR. TS. ABDUL RAZIB DAWOOD**

Ketua Pegawai Eksekutif  
*Chief Executive Officer*

**IR. ABDUL RAHIM IBRAHIM**

Ketua Pegawai Operasi  
*Chief Operating Officer*

**IR. ROSLEE ESMAN**

Pengarah Operasi Industri  
*Director of Industry Operations*

**Barisan belakang (dari kiri ke kanan)**  
*Back row (from left to right)*

**AHMAD RAFDI ENDUT**

Pengarah Perancangan dan Komunikasi Strategik  
*Director of Strategic Planning and Communication*  
Dilantik pada 3 Oktober 2022  
*Appointed on 3 October 2022*

**HILMI RAMLI**

Pengarah Perancangan dan Komunikasi Strategik  
*Director of Strategic Planning and Communication*  
Tamat Perkhidmatan pada 15 Mei 2022  
*Concluded Service on 15 May 2022*

**IR. MD ZAKUAN IBRAHIM**

Pengarah Kawal Selia Keselamatan  
*Director of Safety Regulation*

**NURHAFIZA MOHAMED HASAN**

Pengarah Perancangan dan Pembangunan Industri  
*Director of Industry Planning and Development*

**MARLINDA MOHD ROSLI**

Pengarah Kawal Selia Ekonomi  
*Director of Economic Regulation*

**KAUTHAR MOHD YUSOF**

Pengarah Perkhidmatan Korporat  
*Director of Corporate Services*

**MUNAWIZA JULIANA MOHD JASIN**

Pengarah Undang-Undang  
*Director of Legal Services*  
Tamat Perkhidmatan pada 31 Disember 2022  
*Concluded Service on 31 December 2022*

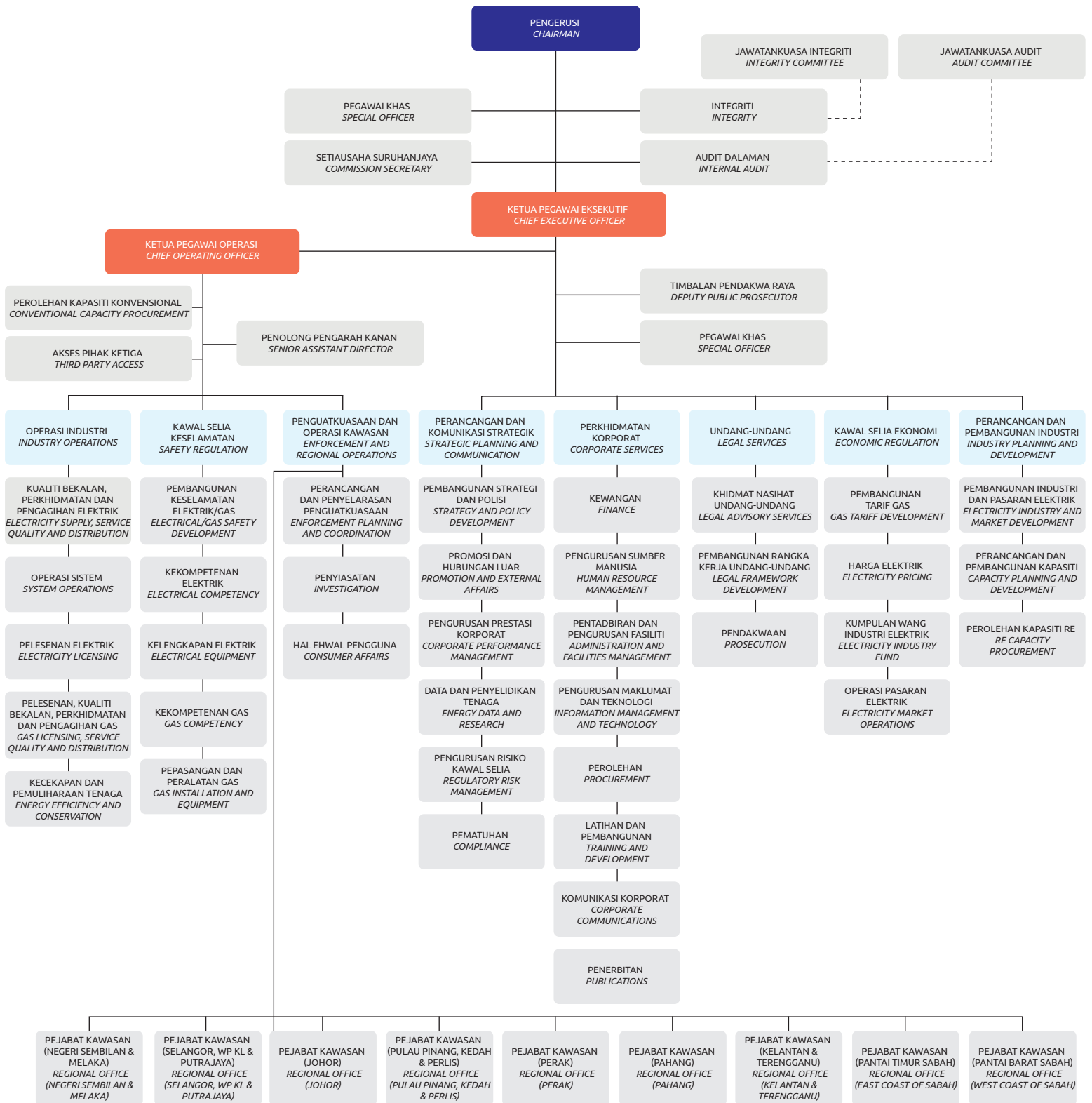






# Struktur Organisasi

## Organisation Structure





# Setahun Yang Lalu - 2022

2022 - A Year That Was

25 JAN  
JAN



Touchpoint Melaka

8 FEB  
FEB



Temu Bual Bersama RTM  
Interview with RTM

16-17 FEB  
FEB



Bengkel Digital Strategy Plan and ICT Roadmap (DSPIR) Future State ("To Be")  
Digital Strategy Plan and ICT Roadmap (DSPIR) Future State ("To Be") Workshop

28 FEB  
FEB



Program Coffee with COO  
Coffee with COO Programme

22 FEB  
FEB



Lawatan ke Bahagian Pendaftaran Kontraktor, CIDB  
Visit to Contractor Registration Division, CIDB

8 FEB  
FEB



Kumpulan Kerja Pembangunan Panduan Electric Vehicle Charging System (EVCS)  
Electric Vehicle Charging System (EVCS) Guide Development Working Group

14 FEB  
FEB



Lawatan daripada Timbalan Pesuruhjaya Tinggi Singapura  
Visit from Deputy High Commissioner of Singapore

23-25 FEB  
FEB



Bengkel Penyelarasan Pengkhususan Pendaftaran Kontraktor Elektrikal & Orang Kompeten CIDB bersama Agensi Siri 1/2022  
Specialisation Coordination Workshop for Registration of Electrical Contractor & CIDB Competent Persons, with Agency Series 1/2022

2 MAC  
MAR



**Program Coffee with CEO**  
*Coffee with CEO Programme*

30 MAC  
MAR



**ASEAN Forum On Coal (AFOC)**  
*ASEAN Forum On Coal (AFOC)*

16 MAC  
MAR



**ASEAN Electrotechnical Symposium**  
*ASEAN Electrotechnical Symposium*

30 MAC  
MAR



**Operasi Penggunaan Elektrik Secara Curang di Sabah**  
*Enforcement on Dishonest Use of Electricity in Sabah*

10 MAC  
MAR



**Lawatan daripada delegasi Korea**  
*Visit from Korean delegation*

29 MAC  
MAR



**Program Coffee with Director**  
*Coffee with Director Programme*



8 APR  
APR



**Ukhwah Ramadan - Bubur Lambuk**  
*Ukhwah Ramadan - Bubur Lambuk*

30 MEI  
MAY



**Lawatan Republik Botswana ke ST**  
*Republic of Botswana's Visit to the Commission*

12 MEI  
MAY



**Program Luncheon With CEO: Visiting Engineer Engagement**  
*Luncheon With CEO: Visiting Engineer Engagement Programme*

13 MEI  
MAY



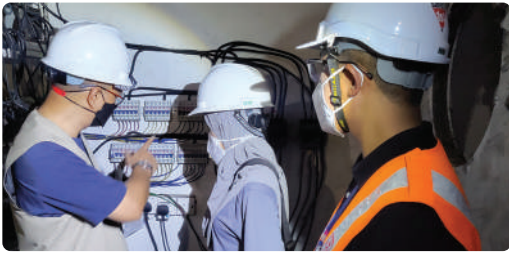
**Lawatan ke Energy Market Authority (EMA), Singapura**  
*Visit to Energy Market Authority (EMA), Singapore*

26 MEI  
MAY



**Majlis Hari Raya ST**  
*The Commission's Eid Event*

1 JUN  
JUNE



**Operasi Bitcoin**  
*Bitcoin Enforcement*

14 JUN  
JUNE



**Bengkel Penghantaran Data NEB**  
*NEB Data Submission Workshop*

2-3 JUN  
JUNE



**Seminar Keselamatan Gas**  
*Gas Safety Seminar*

4 JUL  
JUL



**Pelupusan pelbagai jenis lampu yang tidak mempunyai kelulusan ST bernilai RM95,000**  
*Disposal of various types of lamps without the Commission's approval worth RM95,000*

9 JUN  
JUNE



**Perbincangan dua hala ST-TNB/SESB bagi kerjasama berkaitan keselamatan elektrik**  
*Bilateral discussion between the Commission and TNB/SESB regarding electrical safety cooperation*

16-18 JUN  
JUN



**Bengkel Pemuktamadan Draf Peraturan-Peraturan Elektrik (Pindaan) 2022 Bersama Kementerian Tenaga Dan Sumber Asli**  
*Finalisation Workshop on Draft Electricity Regulations (Amendment) 2022 Together with the Ministry of Energy and Natural Resources*



10 OGOS  
AUG



**ASEAN High-Level Policy Dialogue (HLPD) On Coal (ACE)**  
ASEAN High-Level Policy Dialogue (HLPD) On Coal (ACE)

12 OKT  
OCT



**Bengkel Challenges Ahead For Electricity Supply Security**  
Challenges Ahead For Electricity Supply Security Workshop

7 SEP  
SEP



**Bengkel penambahbaikan Panduan Electric Vehicle Charging System (EVCS) bersama pihak industri**  
Enhancement workshop of the Electric Vehicle Charging System (EVCS) Guide with the industry

18-20 OKT  
OCT



**Mesyuarat Ke-34 Joint Sectoral Committee for Electrical and Electronic Equipment (JSC EEE)**  
34<sup>th</sup> Meeting of Joint Sectoral Committee for Electrical and Electronic Equipment (JSC EEE)

22 OGOS  
AUG



**Sesi mesyuarat kerjasama strategik ST-CIDB bersama Sektor Penguatkuasaan, CIDB**  
ST-CIDB strategic cooperation meeting session with the Enforcement Sector, CIDB

13-15 OKT  
OCT



**Program Karnival KeTSA @ Kota Bharu Prihatin**  
Karnival KeTSA @ Kota Bharu Prihatin Programme

24 SEP  
SEP



EE Run 2022

19-20 OKT  
OCT



**Bengkel Battery Energy Storage Systems (BESS)**  
*Battery Energy Storage Systems (BESS) Workshop*

26 OKT  
OCT



**BEM Convention 2022**

31 OKT  
OCT



**Sidang Media Program Tenaga Hijau Korporat (CGPP)**  
*Corporate Green Power Programme (CGPP) Media Conference*

1 NOV  
NOV



**Mesyuarat Gerak Kerja Keselamatan Elektrik Bil.1/2022 melibatkan warga TNB/SESB, kontraktor dan orang awam**  
*Meeting of the Electrical Safety Task Force No. 1/2022 involving TNB/SESB personnel, contractors, and the general public*

25-28 OKT  
OCT



**Singapore International Energy Week (SIEW) 2023**

10 NOV  
NOV



**Majlis Penganugerahan Sijil Pentauliahan & Perakuan Kekompetenan Institusi**  
*Certificate of Accreditation and Certificate of Competency Presentation Awards Ceremony*



16 NOV  
NOV



**Audit Pemantauan & Pematuhan Institusi di IKM Pasir Gudang, Johor Bahru**  
*Monitoring & Compliance Audit of Institutions at IKM Pasir Gudang, Johor Bahru*

14 DIS  
DEC



**Pelancaran Electric Vehicle Charging Station (EVCS) Bangi Golf Resort**  
*Electric Vehicle Charging Station (EVCS) Bangi Golf Resort Launching*

8 DIS  
DEC



**EE Challenge 2022**

18 DIS  
DEC



**Lawatan Ke Bilik Gerakan Banjir TNB**  
*Visit to TNB Flood Control Room*

23 NOV  
NOV



**Forum Arang Batu 2022**  
*Forum on Coal 2022*

14 DIS  
DEC



**Sesi Libat Urus Dan Pembentangan Oleh Mypower Dan Zico Bersama Pengerusi-Pengerusi Kumpulan Kerja Kecil Di Bawah Kajian Semula Dan Cadangan Pindaan Akta Bekalan Elektrik 1990 [Akta 447] Dan Akta Suruhanjaya Tenaga 2001 [Akta 610]**  
*Engagement Session and Presentation by Mypower and Zico with Chairpersons of Small Working Groups under the Review and Proposed Amendment of the Electricity Supply Act 1990 [Act 447] and Energy Commission Act 2001 [Act 610]*

# Suruhanjaya Tenaga Di Media

## Energy Commission in the Media

Dalam usaha meningkatkan kesedaran orang ramai mengenai ST dan peranannya sebagai badan kawal selia sektor tenaga negara serta isu-isu berkaitan sektor tenaga, ST meneruskan usaha promosi melalui pelbagai saluran media massa termasuk saluran TV, radio, media cetak dan media dalam talian.

*In an effort to increase public awareness about the Commission and its role as the country's regulatory body for the energy sector and energy-related issues, the Commission continues its promotional efforts through various mass media channels, including television, radio, print, and online media.*

## Kenyataan Media

Sepanjang 2022, lebih 20 kenyataan media dikeluarkan dengan topik tumpuan bagi meningkatkan kesedaran orang ramai mengenai langkah-langkah keselamatan elektrik di musim banjir, kepentingan untuk melantik orang kompeten bagi kerja-kerja elektrik, kesalahan dan implikasi kes-kes kecurian elektrik, objektif operasi-operasi penguatkuasaan serta program-program Touchpoint.

## Media Statements

*Throughout 2022, over 20 media statements were issued with a focus on increasing public awareness about electrical safety measures during flood seasons, the importance of appointing competent persons for electrical works, the faults and implications of electrical theft cases, the objectives of enforcement operations, and Touchpoint programmes.*

Di samping itu juga, kenyataan media juga dikeluarkan bagi menyampaikan maklumat mengenai tarif elektrik dan gas berpaip, inisiatif-inisiatif baharu Kerajaan serta siasatan terhadap kes-kes kemalangan elektrik.

*In addition, media statements were also released to provide information on electricity and piped gas tariffs, Government's new initiatives, and investigations into electrical accident cases.*





## Sidang Media

Dalam usaha meningkatkan pemahaman pihak media berkenaan isu-isu semasa dalam sektor tenaga, dua (2) sesi sidang media telah diadakan termasuk bagi Operasi Serbuan Premis Perlombongan *Bitcoin* (OPS RENJAT) serta Pengumuman Program Tenaga Hijau Korporat atau lebih dikenali sebagai *Corporate Green Power Programme* (CGPP).

Sesi-sesi sidang media ini dihadiri oleh pelbagai media termasuk BERNAMA, Berita Harian, Sin Chew Daily, Sinar Harian, RTM, Kosmo, Malaysia Gazette, Utusan, Malaysiakini, TV1 dan TV3.

Antara perkara yang diterangkan di dalam kedua-dua sesi sidang media ini termasuklah inisiatif penguatkuasaan ST dalam membanteras kegiatan curi elektrik oleh premis perlombongan *bitcoin* serta hasrat Kerajaan dalam meningkatkan campuran kapasiti tenaga boleh baharu (TBB) bagi membolehkan sasaran pengurangan pelepasan karbon tahunan tercapai.



**Penerangan kepada media berkenaan operasi bersepadu OPS RENJAT yang dijalankan di sekitar Kajang di mana mesin perlombongan *bitcoin*, kabel dan peralatan melombong *bitcoin* berjaya dirampas.**

*Media briefing on the coordinated operation OPS RENJAT conducted around Kajang, where bitcoin mining machines, cables, and equipment were successfully seized.*

## Press Conferences

*In an effort to enhance the media's understanding of current issues in the energy sector, two (2) media briefing sessions were held, including the Operasi Serbuan Premis Perlombongan *Bitcoin* (OPS RENJAT) and the announcement of the Corporate Green Power Programme (CGPP).*

*These media briefing sessions were attended by various media outlets, including BERNAMA, Berita Harian, Sin Chew Daily, Sinar Harian, RTM, Kosmo, Malaysia Gazette, Utusan, Malaysiakini, TV1, and TV3.*

*Among the matters explained in both media briefing sessions were the enforcement initiatives of the Commission in combating electricity theft activities by bitcoin mining premises and the Government's aspiration to increase the share of renewable energy (RE) capacity to achieve annual carbon emission reduction targets.*



**Penerangan kepada media mengenai Program Tenaga Hijau Korporat (CGPP).**

*Media briefing on the Corporate Green Power Programme (CGPP).*



# Klip Akhbar Newspaper Clippings

## ST Jalankan Siasatan Lanjut Kejadian Gangguan Bekalan Elektrik

By Arif Razali - 30/07/2022

SHARE Facebook Twitter G+ Pinterest



## Banjir: TNB sedia pelbagai aset puih bekalan elektrik - ST



...ajaan perkenal CGPP, sasar lebih  
yak syarikat guna tenaga hijau -  
iyuddin

## Tawar khidmat jim antara taktik kecu

**KUALA LUMPUR:** Suruhanjaya Tenaga (ST) mengingatkan pengguna supaya berwaspada dengan tawaran perkhidmatan penjimatan tenaga elektrik oleh sindiket yang merupakan antara taktik memukul elektrik. Pengarah Jabatan Penguatkuasaan dan Operasi Kawasan ST Mohd Elmi Anas berkata, sindiket tersebut dibahagikan mengumpul kos-pematuhan menu tanpa disedari pengguna dengan mengasik dan mengubah suai meter elektrik bagi mengurangkan bil elektrik pengguna. Beliau bagaimanapun tidak menolak kemungkinan ada juga pengguna yang mendapatkan khidmat daripada pihak tidak bertanggungjawab dan cuba mengurangkan bil elektrik bulanan dengan cara menanggagi dan mengasik sistem pemeteran elektrik di premis mereka. "ST ingin menasihatkan orang ramai supaya tidak mengambil jalan mudah atau tidak mudah terperdaya dengan penawaran untuk meminum elektrik," katanya kepada Bernama baru-baru ini. Beliau berkata, modus operandi dan kaedah yang biasa digunakan oleh pihak tidak bertanggungjawab itu adalah mengingagi meter, sambil melalui meter dan perlawi Mohd Elmi menggunakan curang atau biasanya di pengguna dan nan elektrik erti kilang atau bitcoin dan ada juga di pengguna di "Kegiatan ktrik ini ni alah di be (1) dan Seki Bekhal Elo sabit lesa boleh didena juta atau pel lima tahun pertama m sehingga RM jara selingi kedua-dua dikemalan t kedua dan s "Menggik Akta Bekala pula, pihak seperti Tena had (TNB) tricity Sdn B menuntut hi makhannah membuktik orang telah menanggagi



Abdul Razib (kiri) bercakap pada sidang akhbar Suruhanjaya Tenaga (ST) berhubung rampasan peralatan perkomputeran bitcoin bernilai RM2 juta di Putrajaya di sini, hari ini. - Foto PAISOL MUSTAFA

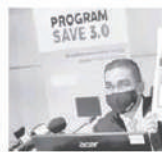
## 349 mesin bitcoin bernilai lebih RM2 juta dirampas

## SAVE 3.0 tawar rebat hingga RM4 beli alat elektrik cekap tenaga

Pemberian e-rebat bagi beli peralatan elektrik dijangka memanfaatkan 140,000

**PUTRAJAYA:** Program Sustainability Achieved via Energy Efficiency (SAVE) 3.0 menawarkan e-rebat hingga RM400 bagi pembelian peralatan elektrik cekap tenaga pada tahun ini dalam lebih banyak pilihan kategori peralatan elektrik.

Menyerasi dan Sumber Asli, Alam Sekitar dan Perubahan Iklim Nik Nazmi Nik Ahmad berkata melancarkan SAVE 3.0 dalam undangan belian, pemberian e-rebat bagi pembelian peralatan elektrik cekap tenaga atau itu tenaga cekap tenaga oleh Suruhanjaya Tenaga (ST) itu dijangka memanfaatkan 140,000 bil rasid di negara ini. Program SAVE 2.0 sebelum ini menawarkan e-rebat sebanyak RM300 dan hanya terhad kepada pembelian penyaman udara atau peti sejuk. Tawaran rebat SAVE 3.0 menawarkan lebih banyak pilihan peralatan elektrik sate kategori sate meliputi pendingin hawa sta peti sek, makulaka kategori dan alat-alat kecekapan, mesin basuh, kechar gelombang mikro atau perak sate. "Pemberian e-rebat bagi SAVE 2.0 adalah tidak layak



CEKAP TENAGA: Takyuddin memujuk kecapan tenaga lima bintang semasa mentawanya di Putrajaya, semalam. Save 3.0 untuk pembelian peralatan e-berita Bernama

“Penerima e-rebat bagi SAVE 2.0 adalah tidak layak untuk memohon kategori satu bagi SAVE 3.0.”

Program SAVE 3.0 dijangka memanfaatkan 140,000 bil rasid di negara ini. Program SAVE 2.0 sebelum ini menawarkan e-rebat sebanyak RM300 dan hanya terhad kepada pembelian penyaman udara atau peti sejuk. Tawaran rebat SAVE 3.0 menawarkan lebih banyak pilihan peralatan elektrik sate kategori sate meliputi pendingin hawa sta peti sek, makulaka kategori dan alat-alat kecekapan, mesin basuh, kechar gelombang mikro atau perak sate. "Pemberian e-rebat bagi SAVE 2.0 adalah tidak layak

## ST anjur seminar keselamatan elektrik dan gas kepada pengusaha rumah inap desa

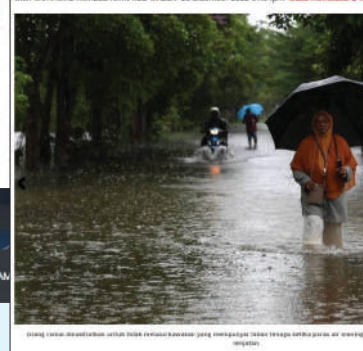
Oleh Kennedy Corlina

**RANAU:** Sebagai langkah meningkatkan kesedaran keselamatan elektrik dan gas dalam kalangan pengusaha rumah inap desa, Suruhanjaya Tenaga (ST) telah mengambil pendekatan mengadakan Seminar Keselamatan Elektrik dan Gas. Melalui seminar tersebut, para peserta diberikan pendedahan mengenai langkah keselamatan elektrik dan gas yang perlu diambil, serta akta dan peraturan berkaitan dengan keselamatan elektrik dan gas. Seminar yang diadakan di Wali Tokou Homestay Kundasang, Ranau itu dihadiri oleh kira-kira 40 pengusaha rumah inap desa di sekitar daerah Ranau. Pengarah Kawasan ST Pantai Barat Sabah (STPBS), Jeffrey Nuri berkata sebagai pengusaha rumah inap desa, keselamatan elektrik dan gas perlu



## Suruhanjaya Tenaga nasihat berhati-hati risiko renjatan elektrik

Oleh MOHAMED AZIZEL, ISAM ABD VALEK - 20 Disember 2022 07:54pm Masa membaca: 2 minit



## RM4.6 juta barangan elektrik, telekomunikasi diseludup disita

Oleh Hafidz Hafidz - September 9, 2022 @ 12:08pm



Suruhanjaya Tenaga (ST) serta Penguatkuasaan (STPBS) telah menyita barangan elektrik dan telekomunikasi diseludup tanpa Perakuan Suruhanjaya Tenaga (ST) serta Permit Import bernilai RM4.6 juta dalam satu buah gudang am di Petaling Jaya, pada 26 Ogos lalu. Ingkapan dibuat. gihan Penguatkuasaan Pematuhan Kastam, yang menaungi tugas tugas Timbalan g, Wan Saadiah Mohamed Muhiyuddin, berkata pihaknya mengesyaki pengimport

## Kerajaan lulus mekani diteruskan hingga per TNB



Menyerasi dan Sumber Asli, Alam Sekitar dan Perubahan Iklim Nik Nazmi Nik Ahmad bercakap pada sidang media pelancongan tarif elektrik di Suruhanjaya Tenaga bagi tempoh 1 Januari hingga 30 Jun 2023 hari ini. - FotoBERNAMA (2022) HAK CIPTA TERPELIHARA



# Energy Commission will not consider TNB's proposal for special cryptomining tariff

By Lucman Hakim - July 16, 2022 @ 8:37pm



The Energy Commission has rejected TNB's proposal for special cryptomining tariff.

## No increase in electricity charges for consumers

**KUALA LUMPUR:** The Energy Commission announced that the government had, on Friday, decided to delay the implementation of Tenaga Nasional Bhd's (TNB) Incentive-Based Regulation for Regulatory Period 3 (IBR3). Hence, from yesterday, the average electricity tariff will remain at 39.45 sen/kWh in the peninsula until further notice, it said. The government also decided to delay the adjustment of electricity tariff under the Imbalance Cost Pass-Through (ICPT) mechanism and maintain an ICPT rebate of 2.00 sen/kWh in the peninsula. With the decision to delay the implementation of IBR3 and ICPT, there will be no increase in electricity charges for consumers. **Bernama**



Makhlis Iyus (second from left) being welcomed by members of Komunitas Ibu Bapa dan Keluarga Anak-Anak Kanak-Kanak Kuala Lumpur after his 168km trek from Kota Bharu, Kelantan, to Kuala Terengganu, on Friday. **BERNAMA**

**KUALA LUMPUR (Dec 28):** A new surcharge on electricity tariff will be imposed on non-domestic electricity users at an Hi-Tech Park (KHTP) and selected domestic users in Sabah and Labuan for the first half of 2023 (1H2023), the Energy Commission (EC) said. However, domestic users across the locations are exempt from the surcharge, and similarly for micro, small and medium enterprises (MSMEs) in Sabah and Labuan, the EC said. In a statement, the EC said the full charge of 8.19 sen/kWh in the period for the imbalance cost pass-through (ICPT) mechanism will be imposed on non-domestic segments of the KHTP, subject to a surcharge of 4.99 sen/kWh in 2H2022. This follows an increase in generation fuel costs on-site in 2H2022 amounting to RM76.02 million, as piped gas price rose to RM32/mmbtu, compared to the expected RM26/mmbtu. In a separate statement, the EC said and

# Targeted electricity tariff surcharge in 1H2023 expanded to Kulim Hi-Tech Park, Sabah, Labuan

BY INTAN FARHANA ZAINUL  
theadgemarkets.com

consist of commercial and industrial will be subject to ICPT surcharge in full at the rate of 10.04 sen/kWh, the EC said. It pointed out that the government will allocate RM212.2 million subsidy for six months for the electricity tariff exemption in Sabah and Labuan. "It is estimated that 99% of all electricity users in Sabah and Labuan, more than 656,000 users, will not be involved with the tariff increase," it added. Recall that in mid-December, the government announced that it would implement a targeted electricity subsidy which would see all domestic users continue to enjoy the two sen/kWh rebate on their power tariff for the period between Jan 1 and June 30, 2023. The government will also not increase the 3.7 sen per kWh surcharge on farmers and animal breeders as well as lower voltage non-domestic users such as micro businesses, and small and medium enterprises (including restaurants, groceries, bakeries and small workshops). In contrast, medium voltage and high

# Energy Commission wants all EV charge point operators to obtain licence

DECEMBER 14, 2022 02:42 PM



The Energy Commission (EC) has announced that it will require all EV charge point operators to obtain a licence by March 31 next year. The EC said that the licence will ensure that operators meet the necessary safety and quality standards for EV charging infrastructure. It also mentioned that the licence will cover various aspects of the charging process, including the safety of the charging equipment and the reliability of the charging network. The EC added that it will continue to monitor the EV charging market and may introduce further regulations as needed. **Bernama**

# Commission says fuel costs will stay elevated in 2H, but sees some price stability

BY ADAM AZIZ  
theadgemarkets.com

(1.1%), and solar (0.9%). TNB, which uses coal and power sector, procures 65% of its power from Indonesia, followed



Among the participants of the programme.

# Homestay operators attend electricity, gas safety seminar

**BANAU:** The Energy Commission conducted a seminar on electricity and gas safety among homestay operators here on Monday. It was attended by 40 homestay operators at the Walai Tokou Homestay Kundasang near here. During the seminar, the homestay operators were exposed to electricity and gas safety steps that need to be taken as well as the importance of ensuring that operators, safety in electrical and gas usage must be emphasized and given serious attention to ensure the safety of their guests. He said that he hoped the awareness level of homestay operators in the matter would be improved. This includes ensuring the installation of suitable electrical and gas safety equipment, such as earth leakage circuit breakers (ELCBs) and gas detectors. **Bernama**

# Energy Commission: Charge point operators must get EVCs licence before March 31 next year

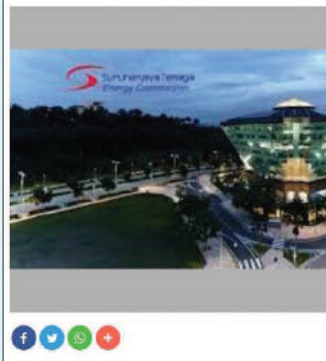


# Energy Commission studying potential power storage to complement existing power grids

By Hasnainah Ghani - August 21, 2022 @ 1:54pm



# No tariff increase for over 650,000 electricity consumers in Sabah, Labuan for six months



**PUTRAJAYA, Dec 28 (Bernama) -** Over 655,000 electricity consumers in Sabah and Labuan will not be affected by tariff increase from Jan 1 until June 30, 2023, under the Incentive-Based Regulation for Regulatory Period 3 (IBR3) implementation.

The Energy Commission (EC) in a statement informed that domestic and non-domestic consumers who are exempted from the ICPT surcharge comprise micro, small and medium enterprises (PMKs) in the low voltage commercial tariff category.

# RM11.7b electricity subsidy provided since 2015

**KUALA LUMPUR:** The government has provided a total electricity subsidy of RM11.7 billion through the Incentive-Based Regulation for Regulatory Period 3 (IBR3) mechanism since 2015. This helps Tenaga Nasional Bhd (TNB) to remain neutral on the variations in fuel prices. TNB said the recent announcement on the implementation of the ICPT mechanism from last Friday to Dec 31 had again proven the support of the government in stabilizing the mechanism. It said this was consistent with the incentive-based Regulation framework. "The Energy Commission has released a statement saying the tariff remains as the government is maintaining the surcharge at 3.7 sen per kWh for non-domestic customers and the rebate of 2.00 sen per kWh for domestic customers. "The government has agreed to fund the rebate and surcharge totalling RM6.5 billion," said the national utility company. "TNB noted that the fuel price hike had resulted in the company carrying higher than usual receivables balances. "TNB is confident in the government's ability to manage the electricity market and ensure the stability of the electricity supply. **Bernama**

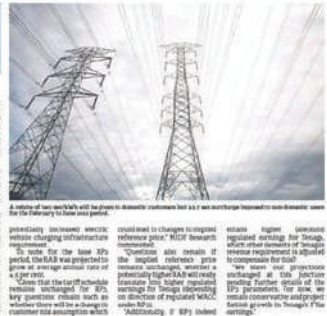


While EC disclosed that the 1 sen/kWh rebate for domestic users will be funded by EVCs amounting to RM75 million, there is no details on the surcharge. He estimated that the 3.7 sen/kWh surcharge amounts to circa RM10 billion for Tenaga Nasional Bhd (TNB).

# Base tariff maintained at 39.45 sen/kWh for RP3

By The Star

**KUALA LUMPUR:** The Energy Commission (EC) has maintained the base electricity tariff at 39.45 sen/kWh for the first half of 2023 (1H2023). The EC said that the base tariff will remain unchanged for domestic and non-domestic consumers in the peninsula. It also mentioned that the EC will continue to monitor the electricity market and may introduce further regulations as needed. The EC added that it will continue to monitor the electricity market and may introduce further regulations as needed. The EC added that it will continue to monitor the electricity market and may introduce further regulations as needed. **Bernama**





## Liputan Media

Selain itu, majlis-majlis yang dianjurkan oleh ST turut mendapat liputan luas oleh media termasuk Majlis Penganugerahan Sijil Pentauliahannya Institusi dan Perakuan Kekompetenan, Majlis Penyampaian Hadiah *EE Challenge 2022*, Majlis Pelancaran Stesen Pengecas Kenderaan Elektrik (EV) dan Penyerahan Lesen Pengagihan Awam bagi Sistem Pengecas Kenderaan Elektrik (EVCS).

## Media Coverage

Furthermore, events organised by the Commission also received extensive media coverage, including the Certificate of Accreditation and Certificate of Competency Presentation Awards Ceremony, the *EE Challenge 2022 Prize Presentation Ceremony*, the Launch of Electric Vehicle (EV) Charging Stations, and the Public Distribution License Handover for Electric Vehicle Charging Systems (EVCS).

**8** Disember  
December



Penerangan kepada media oleh YBhg. Dato' Hj Rosli Bin Isa, Ketua Setiausaha Kementerian di Majlis Penyampaian Hadiah *EE Challenge 2022*.

*Media briefing by YBhg. Dato' Hj Rosli Bin Isa, Chief Secretary of the Ministry, at the EE Challenge 2022 Prize Presentation Ceremony.*

**14** Disember  
December



Penerangan kepada media oleh YB Tuan Nik Nazmi bin Nik Ahmad, Menteri Sumber Asli, Alam Sekitar dan Perubahan Iklim berkenaan Stesen Pengecas Kenderaan Elektrik di Bangi Golf Resort.

*Media briefing by YB Tuan Nik Nazmi bin Nik Ahmad, Minister of Natural Resources, Environment, and Climate Change, regarding the Electric Vehicle Charging Station at Bangi Golf Resort.*

Liputan luas mengenai ST dalam pelbagai saluran media sekaligus meningkatkan kredibiliti ST sebagai pusat rujukan untuk sektor tenaga negara, selain meningkatkan kefahaman rakyat mengenai isu-isu semasa berkaitan pembekalan dan keselamatan elektrik dan gas berpaip.

*Extensive coverage of the Commission across various media channels enhances the Commission's credibility as a reference for the national energy sector. It also helps increase public understanding of current issues related to electricity and piped gas supply and safety.*



# 1. MENGUTAMAKAN KESELAMATAN DAN PENGUATKUASAAN

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# Prestasi Kemalangan Elektrik dan Gas Berpaip

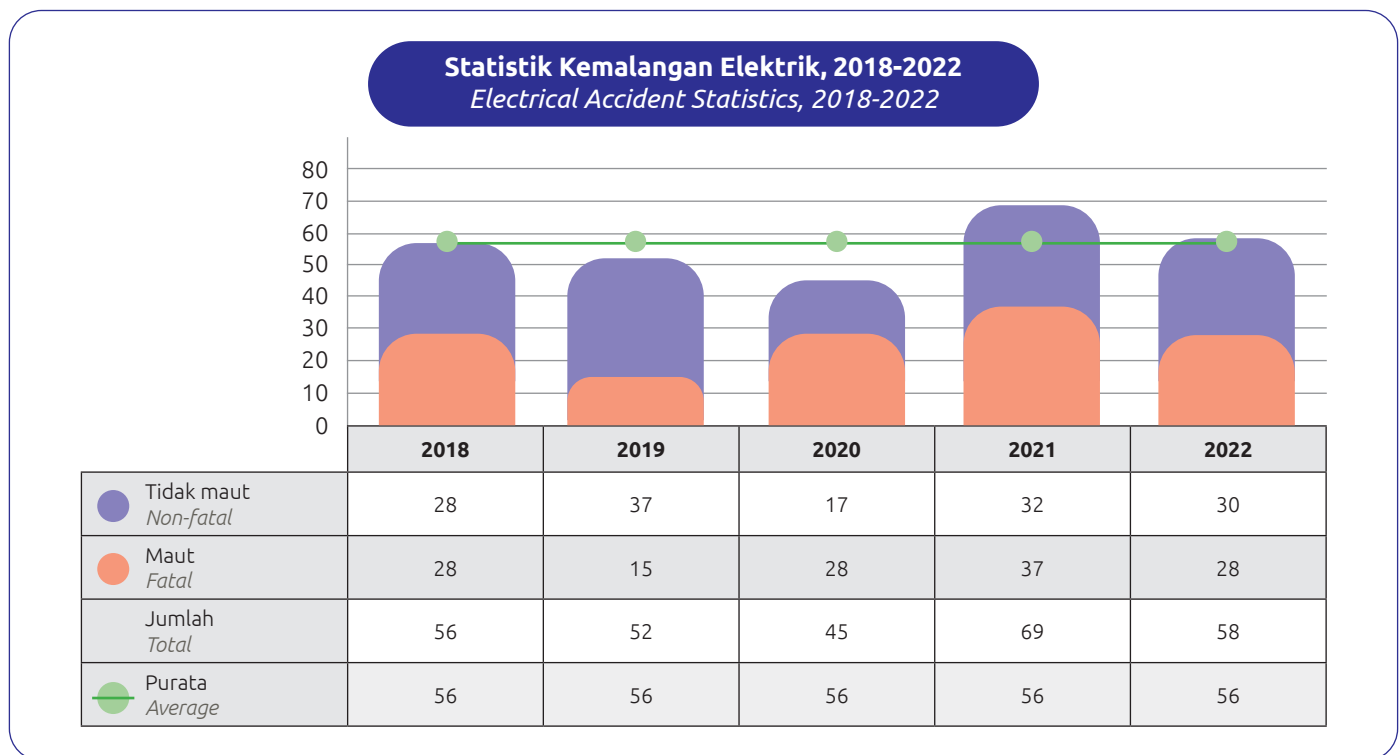
## Electrical and Piped Gas Accident Performance

### Statistik Kemalangan Elektrik

Sejak 2018, sebanyak 280 kes kemalangan elektrik dilaporkan dan disiasat oleh ST, melibatkan 136 kes maut dan 144 kes tidak maut. Untuk 2022, kemalangan elektrik menurun kepada 58 kes (28 maut dan 30 tidak maut) berbanding 69 kes tahun sebelumnya. Analisis menunjukkan purata kemalangan elektrik yang berlaku sejak lima (5) tahun lalu adalah sebanyak 56 kes setahun.

### Electrical Accident Statistics

Since 2018, a total of 280 cases of electrical accidents have been reported and investigated by the Commission, involving 136 fatal cases and 144 non-fatal cases. In 2022, electrical accidents decreased to 58 cases (28 fatal and 30 non-fatal) compared to 69 cases the previous year. Analysis showed that the average number of electrical accidents occurring over the past five (5) years is 56 cases per year.



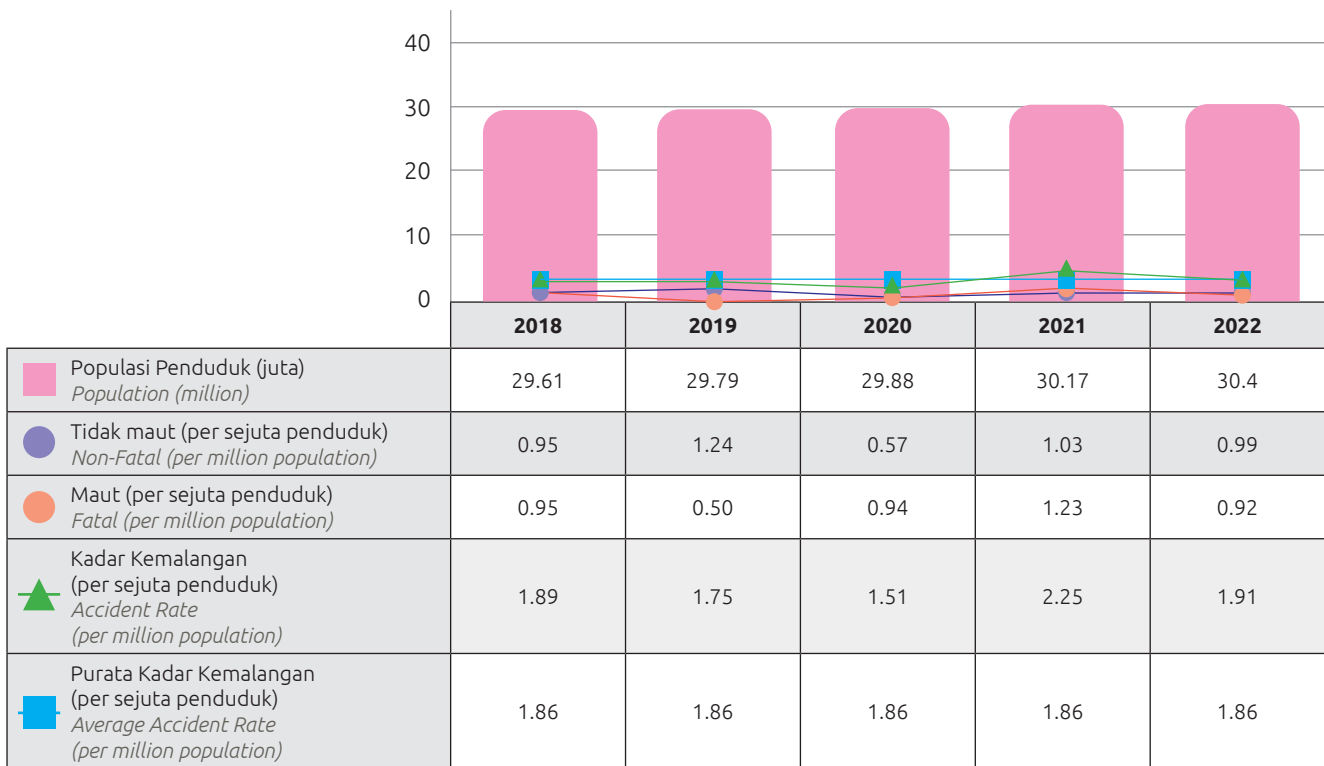
### Kadar Kemalangan Elektrik Mengikut Populasi

Populasi penduduk Semenanjung dan Sabah menunjukkan pertambahan sebanyak 2.7% bagi tempoh lima (5) tahun ke belakang. Walaupun demikian, purata kadar kes kemalangan elektrik setiap sejuta penduduk bagi tempoh lima (5) tahun sejak 2018 menunjukkan penurunan kepada 1.86, berbanding 1.89 untuk tempoh lima (5) tahun sebelumnya.

### Electrical Accident Rate by Population

The population of the Peninsula and Sabah has shown an increase of 2.7% over the past five (5) years. However, the average rate of electrical accidents per one million population for the five (5) year period since 2018 has decreased to 1.86, compared to 1.89 for the previous five (5) year period.

### Kadar Kemalangan Per Populasi, Perbandingan Tempoh 5-Tahun Accident Rate per Population: 5-year Comparison



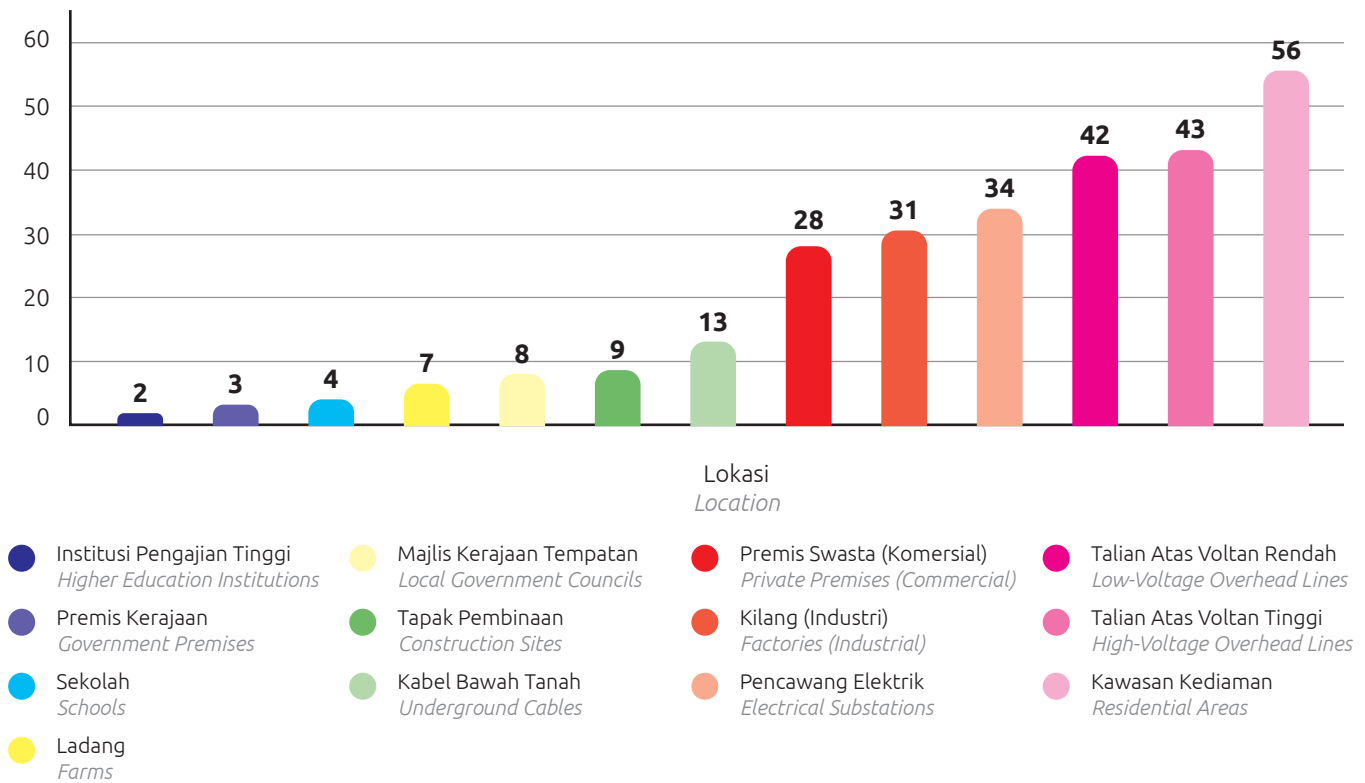
### Lokasi Kemalangan Elektrik

Untuk 2022, sebanyak 12 kes kemalangan dicatatkan di talian atas voltan rendah dan diikuti 11 kes di kawasan kediaman. Lokasi ketiga tertinggi berlaku kemalangan adalah di talian atas voltan tinggi seterusnya tapak pembinaan. Bagaimanapun, kemalangan di kawasan kediaman, kilang dan komersial menunjukkan penurunan melebihi 30% berbanding tahun sebelumnya. Hasil analisis kes kemalangan terdahulu, ST memfokuskan orang awam sebagai golongan sasar bagi pelbagai inisiatif kesedaran keselamatan elektrik untuk mengurangkan kemalangan di kawasan kediaman.

### Electrical Accident Locations

In 2022, a total of 12 accidents were recorded in low voltage overhead lines, followed by 11 cases in residential areas. The third-highest location for accidents was in high-voltage overhead lines, followed by construction sites. However, accidents in residential, industrial, and commercial areas showed a decrease of over 30% compared to the previous year. Based on the analysis of past accident cases, the Commission has focused on the general public as the target group for various electrical safety awareness initiatives to reduce accidents in residential areas.

**Kemalangan Elektrik Mengikut Lokasi, 2018-2022**  
*Electrical Accidents by Location, 2018-2022*



**Punca Kemalangan Elektrik**

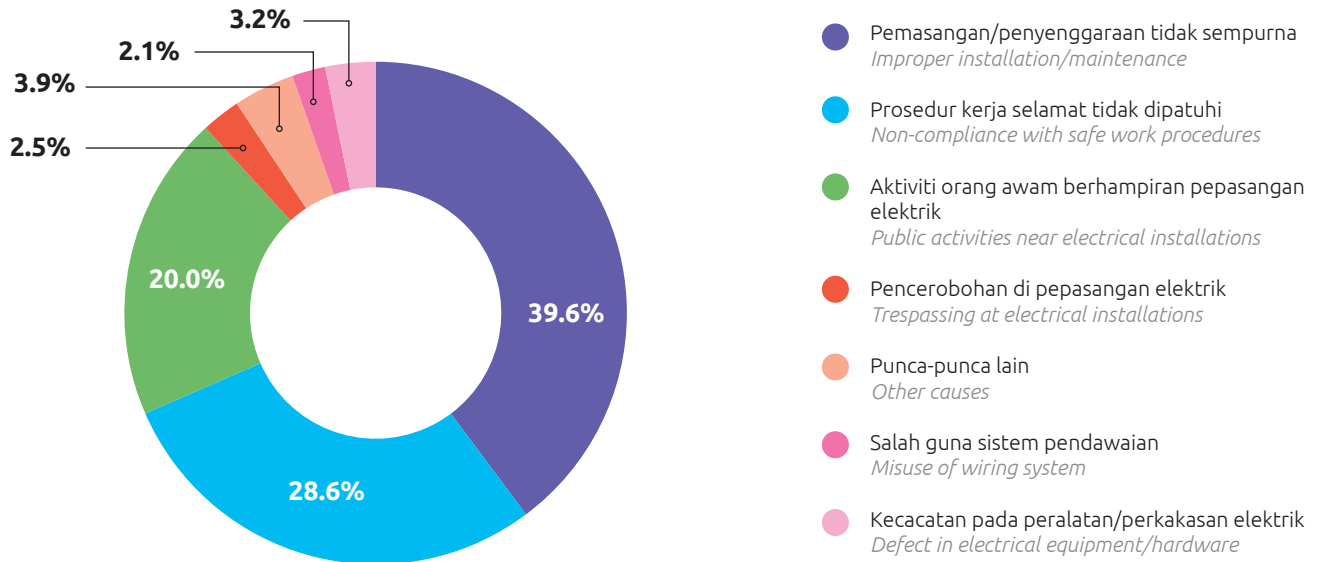
Pada 2022, jumlah kemalangan akibat pemasangan dan penyenggaraan yang tidak sempurna menurun kepada 22 kes berbanding 34 kes pada tahun sebelumnya. Jumlah kemalangan akibat ketidakpatuhan terhadap prosedur kerja selamat juga menurun kepada 15 kes berbanding 16 kes pada tahun sebelumnya. Manakala aktiviti kerja orang awam berhampiran dengan pemasangan elektrik meningkat kepada 14 kes berbanding 11 kes pada tahun sebelumnya. Inisiatif-inisiatif berterusan akan diambil oleh ST dalam memastikan pemasangan elektrik di lokasi-lokasi utama berlakunya kes kemalangan elektrik dipasang dan disenggara dengan sempurna dan amalan kerja selamat di kalangan pihak utiliti dan kontraktor sentiasa dipatuhi.

**Causes of Electrical Accidents**

*In 2022, the number of accidents due to improper installation and maintenance decreased to 22 cases compared to 34 cases in the previous year. The number of accidents due to non-compliance with safe work procedures also decreased to 15 cases compared to 16 in the previous year, while the number of incidents involving public work activities near electrical installations increased to 14 cases compared to 11 in the previous year. Continuous initiatives will be taken by the Commission to ensure that electrical installations in the main locations where electrical accidents occur are properly installed and maintained and that safe work practices are consistently adhered to among utility companies and contractors.*



**Kemalangan Elektrik Mengikut Punca, 2018-2022**  
*Electrical Accidents by Cause, 2018-2022*



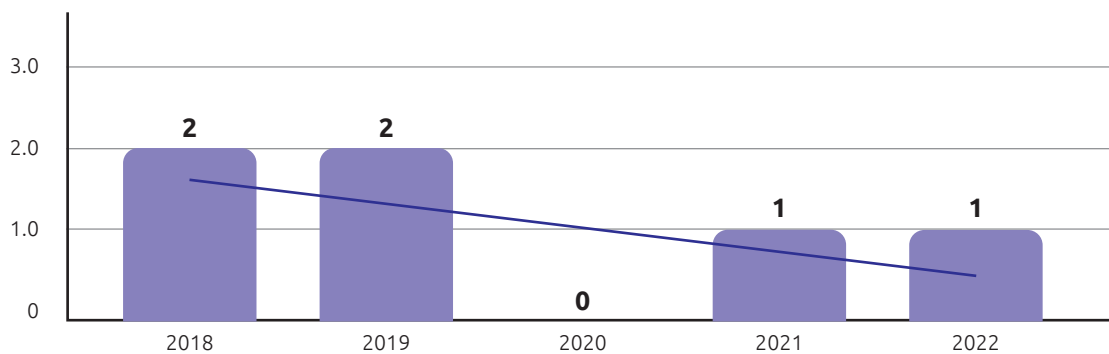
**Statistik Kemalangan Gas Berpaip**

Sejak 2018, sebanyak enam (6) kes kemalangan gas direkodkan, termasuk satu (1) kes pada 2022. ST terus berusaha untuk melakukan penambahbaikan dari masa ke masa dengan menjalankan program-program libat urus bersama unit dan jabatan lain di ST serta agensi-agensi, golongan sasaran dan pihak berkuasa tempatan (PBT) yang berkaitan.

**Piped Gas Accident Statistics**

Since 2018, a total of six (6) cases of gas accidents have been recorded, including one (1) case in 2022. The Commission continues to strive for improvement over time by conducting engagement programmes with units and departments within the Commission, as well as relevant agencies, target groups, and local authorities (PBT).

**Statistik Kemalangan Gas Berpaip, 2018-2022**  
*Piped Gas Accident Statistics, 2018-2022*



## Lokasi Kemalangan Gas Berpaip

Daripada enam (6) kes kemalangan yang direkodkan sejak 2018, tiga (3) kes berlaku di premis dobi, yang merupakan lokasi yang mencatatkan jumlah kemalangan tertinggi. Pusat beli-belah, restoran dan paip bawah tanah masing-masing merekodkan satu (1) kes. Pencapaian lima (5) tahun kebelakangan ini adalah hasil usahasama dan penggemblengan program-program yang dijalankan ST bersama agensi dan PBT yang berkaitan.

## Punca Kemalangan Gas Berpaip

Untuk tempoh 2018-2022, prosedur kerja tidak sempurna menjadi faktor utama dengan lima (5) kes kemalangan, manakala penyenggaraan tidak sempurna menyumbang sebanyak satu (1) kes. Bagi mengurangkan kadar kes kemalangan gas, pada 2020, ST mengeluarkan garis panduan lengkap khusus untuk sistem gas berpaip di premis dobi iaitu *Guidelines on Gas Piping Systems at Launderettes and Similar Installations*, yang juga boleh diperolehi di laman web ST. Pada 2022 pula, sebanyak dua (2) program libat urus bersama golongan sasar telah dijalankan di samping program hebahan melalui media massa. Program-program ini diharap dapat memberi kesedaran kepada semua pihak tentang keselamatan penggunaan gas serta mempertingkatkan lagi kefahaman Orang Kompeten gas agar dapat menjalankan dan mempraktikkan tugas mengikut akta, peraturan, garis panduan dan piawaian yang telah ditetapkan.

## Piped Gas Accident Locations

*Out of the six (6) recorded accidents since 2018, three (3) cases occurred in launderettes, which is the location with the highest number of accidents. Shopping centres, restaurants, and underground pipes each recorded one (1) case. The achievements over the past five (5) years are the result of collaboration and joint efforts in implementing programmes by the Commission with relevant agencies and PBT.*

## Causes of Piped Gas Accidents

*During the period of 2018-2022, improper work procedures were the main contributing factor in five (5) gas accidents, whereas improper maintenance accounted for one (1) case. To reduce the rate of gas accidents, in 2020, the Commission issued comprehensive guidelines specifically for piped gas systems in launderettes, named *Guidelines on Gas Piping Systems at Launderettes and Similar Installations*, which is also available on the Commission's website. In 2022, two (2) engagement programmes with target groups were conducted alongside promotional programmes through mass media. These programmes are aimed at raising awareness among all parties about the gas safety and further enhancing the understanding of Competent Persons to enable them to carry out and practice tasks according to the established act, regulations, guidelines and standard.*

# Inisiatif-Inisiatif Mempertingkatkan Tahap Keselamatan Elektrik dan Gas Berpaip

## Initiatives to Improve Electrical and Piped Gas Safety

### Guide On Electric Vehicle Charging System (EVCS)

Bagi memastikan keselamatan dalam industri kenderaan elektrik, ST telah membangunkan *Guide on Electrical Vehicle Charging System (EVCS)*, sebagai panduan ringkas kepada semua Orang Kompeten, kontraktor elektrik dan jurutera perunding yang terlibat dalam kerja pendawaian elektrik EVCS

### Guide On Electric Vehicle Charging System (EVCS)

*To ensure safety in the electric vehicle industry, the Commission has developed the *Guide on Electrical Vehicle Charging System (EVCS)* as a concise reference for all Competent Persons, electrical contractors, and consulting engineers involved in the electrical wiring of EVCS and its supporting infrastructure. This guide*

dan infrastruktur sokongannya. Panduan ini juga dikeluarkan untuk memastikan EVCS mematuhi semua keperluan di bawah akta, peraturan dan piawaian berkaitan serta bagi menetapkan standard dan spesifikasi minimum dalam reka bentuk, pemasangan, pemeriksaan, ujian, penyeliaan, pengendalian dan penyelenggaraan EVCS.

Panduan yang telah dimuat naik di laman sesawang ST pada Julai 2022 ini adalah hasil perbincangan dengan wakil pelbagai organisasi dan pemegang taruh termasuk Kementerian Pengangkutan, Malaysian Green Technology and Climate Change Corporation (MGTC), Tenaga Nasional Berhad (TNB), Malaysia Board of Technologists (MBOT), Malaysia Automotive, Robotics & IoT Institute (MARii), SIRIM QAS International Sdn. Bhd., Universiti Malaya Power Energy Dedicated Advanced Centre (UMPEDAC), Electric Vehicle Association Of Malaysia (EVAM), Motorcycle and Scooter Assemblers and Distributors Association of Malaysia (MASAAM) dan EV Charging Infrastructure Association.

Panduan ini diharap dapat menjadi sumber rujukan yang jelas, ringkas dan padat kepada Orang Kompeten, kontraktor elektrik, jurutera perunding dan mereka yang terlibat untuk memastikan sistem pendawaian elektrik di pemasangan EVCS dibuat dengan sempurna, tiada gangguan sistem bekalan dan selamat sekaligus mengurangkan risiko kemalangan.

## Gerak Kerja Keselamatan Elektrik

Susulan perbincangan dua hala antara ST dan TNB/Sabah Electricity Sdn. Bhd. (SESB), Gerak Kerja Keselamatan Elektrik ditubuhkan bertujuan mewujudkan perkongsian strategik ke arah pengurangan kes kemalangan elektrik yang melibatkan anggota kerja TNB/SESB, kontraktor dan orang awam.

Gerak Kerja yang dipengerusikan bersama oleh Ketua Pegawai Operasi ST dan Head (Strategy & Transformation), TNB Global Business Solutions Division (TGBS) ini akan bekerjasama untuk melaksanakan aktiviti/program keselamatan elektrik, mengkaji keseluruhan pelaksanaan aktiviti/program dan meningkatkan usaha untuk penambahbaikan aktiviti/program keselamatan elektrik, mempromosikan aktiviti/

*was also issued to ensure that EVCS complies with all requirements under relevant acts, regulations, and standards, as well as to establish minimum standards and specifications for the design, installation, inspection, testing, supervision, operation, and maintenance of EVCS.*

*The guide, which was uploaded to the Commission's website in July 2022, is the result of discussions with representatives from various organisations and stakeholders, including the Ministry of Transport, Malaysian Green Technology and Climate Change Corporation (MGTC), Tenaga Nasional Berhad (TNB), Malaysia Board of Technologists (MBOT), Malaysia Automotive, Robotics & IoT Institute (MARii), SIRIM QAS International Sdn. Bhd., Universiti Malaya Power Energy Dedicated Advanced Centre (UMPEDAC), Electric Vehicle Association Of Malaysia (EVAM), Motorcycle and Scooter Assemblers and Distributors Association of Malaysia (MASAAM), and EV Charging Infrastructure Association.*

*This guide is intended to serve as a clear, concise, and comprehensive reference for Competent Persons, electrical contractors, consulting engineers, and those involved to ensure that the electrical wiring system in EVCS installations is done perfectly, without any supply system disruptions, and is safe, thus reducing the risk of accidents.*

## Electrical Safety Task Force

*Following bilateral discussions between the Commission and TNB/Sabah Electricity Sdn. Bhd. (SESB), the Electrical Safety Task Force was established with the aim of creating a strategic partnership towards reducing electrical accidents involving TNB/SESB employees, contractors, and the general public.*

*The task force, jointly chaired by the Chief Operating Officer of the Commission and the Head (Strategy & Transformation) of TNB Global Business Solutions Division (TGBS), will collaborate to implement electrical safety activities/programmes, evaluate the overall implementation of activities/programmes, and enhance efforts to improve electrical safety activities/programmes. It will also promote electrical safety*

program keselamatan elektrik serta mengemukakan syor kepada pihak pengurusan ST dan TNB/SESB berkaitan perkara-perkara yang berbangkit.

## Program Kesedaran Keselamatan

ST mengadakan pelbagai program kesedaran keselamatan bersama agensi-agensi kerajaan, PBT, pihak utiliti, industri, pemegang taruh dan golongan sasar yang berkaitan bagi membincangkan isu-isu semasa keselamatan elektrik dan gas berpaip agar selari dengan keperluan industri masa kini tanpa mengabaikan keselamatan umum.

Antara program-program yang dijalankan adalah:

- 10 Program Kuasa di Tangan Anda iaitu seminar keselamatan dan kecekapan tenaga hasil kerjasama antara Politeknik, TNB dan ST. Program ini merupakan sebahagian daripada inisiatif di dalam *Malaysia Energy Literacy Programme (MELP)* bertujuan memberi pendedahan berkaitan keselamatan elektrik dan kecekapan tenaga kepada warga pendidik dan pelajar.
- *The Institution of Engineers, Malaysia (IEM) – Standards Malaysia – Suruhanjaya Tenaga ASEAN Electrotechnical Symposium 2022.*
- *Electric Vehicle Seminar (Institution of Electrical Engineers (IEE) - The Electrical and Electronics Association of Malaysia (TEEAM)).*
- *SESB Health, Safety and Environment (HSE) Symposium.*
- *Electrical Safety Talk, ASEAN Mechanical and Electrical (M&E) Show.*

Beberapa mesyuarat, lawatan pemeriksaan serta audit keselamatan sebagai inisiatif-inisiatif untuk mempertingkatkan tahap keselamatan elektrik dan gas berpaip turut dijalankan. Selain itu, beberapa program juga dijalankan oleh Pejabat-Pejabat Kawasan ST bagi meningkatkan keselamatan dan kecekapan tenaga.

*activities/programmes and provide recommendations to the management of the Commission and TNB/SESB regarding relevant issues that arise.*

## Safety Awareness Programme

*The Commission organised various safety awareness programmes in collaboration with government agencies, PBT, utility companies, industries, stakeholders, and relevant target groups to discuss current issues related to electrical and piped gas safety to align with the needs of the industry without compromising public safety.*

*Among the programmes conducted include:*

- *10 Program Kuasa di Tangan Anda, which was an energy safety and efficiency seminar conducted in collaboration with Politeknik, TNB, and the Commission. This programme was part of the Malaysia Energy Literacy Programme (MELP), aimed at providing exposure to educators and students on electrical safety and energy efficiency.*
- *The Institution of Engineers, Malaysia (IEM) – Standards Malaysia – Suruhanjaya Tenaga ASEAN Electrotechnical Symposium 2022.*
- *Electric Vehicle Seminar (Institution of Electrical Engineers (IEE) - The Electrical and Electronics Association of Malaysia (TEEAM)).*
- *SESB Health, Safety and Environment (HSE) Symposium.*
- *Electrical Safety Talk, ASEAN Mechanical and Electrical (M&E) Show.*

*Several meetings, inspection visits, and safety audits were conducted as initiatives to enhance the level of electrical and piped gas safety. Additionally, several programmes were also carried out by the Commission's Regional Offices to improve energy safety and efficiency.*





Untuk meningkatkan kesedaran mengenai keselamatan gas, pelbagai program telah dijalankan termasuk Seminar Keselamatan Sistem Gas Berpaip 2022 di Kuantan, Pahang, Bengkel Pelan Mitigasi Kemalangan Gas Bersama Orang Kompeten Gas di Kota Kinabalu, Sabah serta Lawatan Pemeriksaan Tapak Pemasangan Gas di PNB Merdeka 118. Selain itu, beberapa lawatan pemasangan turut dilaksanakan termasuk lawatan pemasangan *liquefied natural gas* (LNG) di Turkiye bagi melihat pembangunan infrastruktur dan pelaksanaan sistem retikulasi LNG di negara itu.

*To enhance awareness of gas safety, various programmes have been conducted, including the Piped Gas Safety Seminar 2022 in Kuantan, Pahang, the Gas Accident Mitigation Plan Workshop with Gas Competent Persons in Kota Kinabalu, Sabah, and Site Visits to Gas Installation at PNB Merdeka 118. Additionally, several installation visits have been carried out, including a visit to liquefied natural gas (LNG) installations in Turkey to observe the development of infrastructure and the implementation of LNG reticulation systems in the country.*



## Mempertingkatkan Pematuhan Terhadap Peraturan

### *Improving Compliance with Regulations*

#### Pelesenan Elektrik

##### **Pengeluaran Lesen Pemasangan Awam dan Pemasangan Persendirian (bagi Kapasiti 5 MW dan ke atas)**

Sehingga 2022, sejumlah 2,729 lesen dikeluarkan bagi pemasangan awam dan pemasangan persendirian (bagi kapasiti 5 MW dan ke atas). Daripada jumlah tersebut, 2,653 lesen (97.2%) adalah pemasangan awam, manakala baki 76 lesen (2.8%) adalah pemasangan persendirian (bagi kapasiti 5 MW dan ke atas) dan pemasangan persendirian (kojana). Bermula Jun 2022, pengeluaran lesen provisional telah dihentikan.

#### *Electrical Licensing*

##### ***Issuance of Licences for Public Installations and Private Installations (for Capacities of 5 MW and above)***

*Until 2022, a total of 2,729 licences were issued for public and private installations (for capacities of 5 MW and above). Out of this total, 2,653 licences (97.2%) were for public installations, while the remaining 76 licences (2.8%) were for private installations (for capacities of 5 MW and above) and private installations (cogeneration). Starting from June 2022, the issuance of provisional licences has been discontinued.*

## Jumlah Pengeluaran Lesen Mengikut Kategori, Sehingga 2022

*Total Licences Issued by Category, Until 2022*

Kategori Lesen <i>Licence Category</i>	Kapasiti <i>Capacity</i>	Bilangan Lesen <i>Number of Licences</i>
	MW	Bil <i>No</i>
Lesen Awam (Kojana) <i>Public Licences (Cogeneration)</i>	715.40	18
Lesen Awam (LSS) <i>Public Licences (LSS)</i>	1,916.52	50
Lesen Awam (NEDA) <i>Public Licences (NEDA)</i>	451.30	7
Lesen Awam (NEM) <i>Public Licences (NEM)</i>	760.77	1,479
Lesen Awam (Pengagihan) <i>Public Licences (Distribution)</i>	7,679.67	458
Lesen Awam Penjanaaan Tenaga Boleh Baharu (TBB) <i>Public Licences for Renewable Energy (RE) Generation</i>	1,954.17	593
Lesen Awam (Utiliti) <i>Public Licences (Utilities)</i>	19,498.74	2
Lesen IPP <i>IPP Licences</i>	29,654.96	39
Lesen Persendirian (5 MW dan ke atas) <i>Private Licences (5 MW and above)</i>	281.18	33
Lesen Persendirian (Kojana) <i>Private Licences (Cogeneration)</i>	1,514.70	43
Lesen Awam (Pengagihan) EVCS <i>Public Licences (Distribution) EVCS</i>	2.08	7
<b>Jumlah</b> <i>Total</i>	<b>64,429.48</b>	<b>2,729</b>

Pengeluaran lesen tertinggi dicatatkan daripada permohonan lesen awam *Net Energy Metering (NEM)* berjumlah 1,479 lesen, berikutan pelancaran program NEM 3.0 (*Gomen/Net Offset Virtual Aggregation (NOVA)*), diikuti oleh permohonan lesen Tenaga Boleh Baharu (TBB) berjumlah 593 lesen dan permohonan lesen awam pengagihan berjumlah 458 lesen.

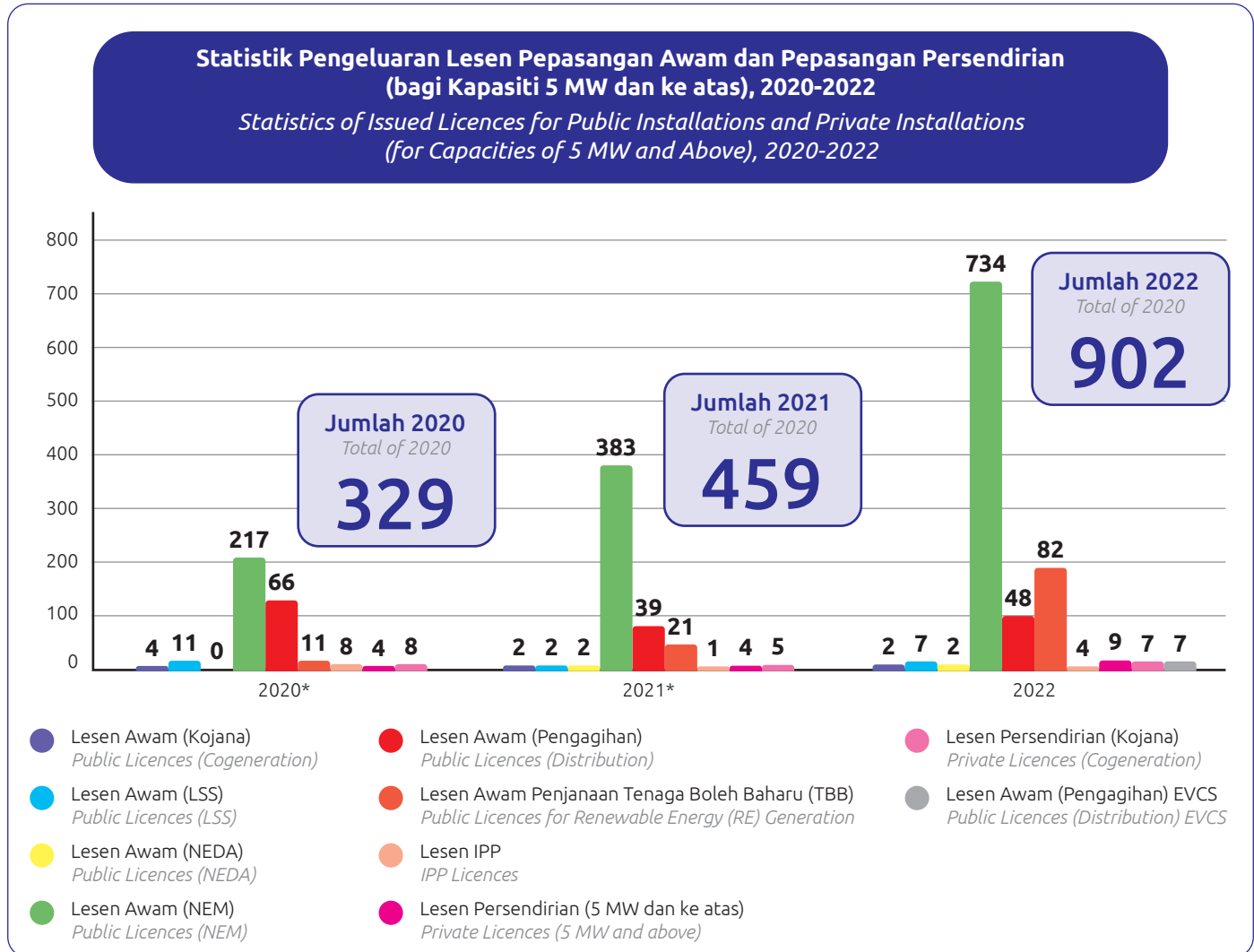
Selain itu, ST juga meluluskan kategori baharu bagi pengeluaran Lesen Awam (Pengagihan - EVCS) pada Jun 2022. Pengeluaran lesen EVCS bermula pada Oktober 2022 dan sehingga Disember 2022, tujuh (7) lesen EVCS dikeluarkan kepada *Charge Point Operator (CPO)* yang bertindak sebagai operator untuk menjalankan aktiviti pembekalan elektrik bagi tujuan komersial untuk tempoh 10 tahun. Lesen yang dikeluarkan adalah bertujuan untuk menjalankan fungsi kawal selia bagi aspek keselamatan serta kepentingan orang awam dari sudut pemasangan, pengendalian dan pengoperasian namun tidak melibatkan aktiviti kawal selia ekonomi.

*The highest number of licences issued was for the public applications of Net Energy Metering (NEM), totalling 1,479 licences, following the launch of the NEM 3.0 programme (Gomen/Net Offset Virtual Aggregation (NOVA)). This was followed by applications for Renewable Energy (RE) licences, with a total of 593 licences, and applications for public distribution licences, totalling 458 licences.*

*Furthermore, the Commission also approved a new category for the issuance of Public Licences (Distribution - EVCS) in June 2022. The issuance of EVCS licences commenced in October 2022, and as of December 2022, seven (7) EVCS licences have been issued to the Charge Point Operator (CPO) acting as an operator to carry out commercial electric supply activities for a period of 10 years. The licences issued aim to regulate safety and public interests aspects regarding installation, operation, and maintenance, but do not involve economic regulatory activities.*

Untuk 2022, jumlah pengeluaran lesen pemasangan awam dan pemasangan persendirian (bagi kapasiti 5MW dan ke atas) telah mencatatkan peningkatan sebanyak 96.5% daripada 459 lesen pada 2021 kepada 902 lesen.

For 2022, the number of licences issued for public and private installations (for capacities of 5 MW and above) has recorded an increase of 96.5%, from 459 licences in 2021 to 902 licences.



Nota /Note:

EVCS – Electric Vehicle Charging System  
LSS – Large Scale Solar  
NEDA – New Enhanced Dispatch Arrangement  
NEM – Net Energy Metering

RE- Renewable Energy (Feed-in-Tariff)  
TBB – Tenaga Boleh Baharu (Feed-in-Tariff)  
\*Data terkini Online Application System (OAS)  
\*The latest data from Online Application System (OAS)

## Pelesenan Gas Berpaip

### Lesen di bawah Akta Bekalan Gas 1993 (ABG 1993)

Sehingga 31 Disember 2022, sebanyak 46 lesen berkaitan Akses Pihak Ketiga telah dikeluarkan oleh ST, dalam usaha meningkatkan lagi kadar persaingan dalam sektor pasaran gas asli secara berpaip di Semenanjung dan Sabah.

## Piped Gas Licensing

### Licence under the Gas Supply Act (GSA) 1993

As of 31 December 2022, a total of 46 Third-Party Access licences have been issued by the Commission in order to further enhance competition in the natural gas market sector through pipelines in the Peninsula and Sabah.

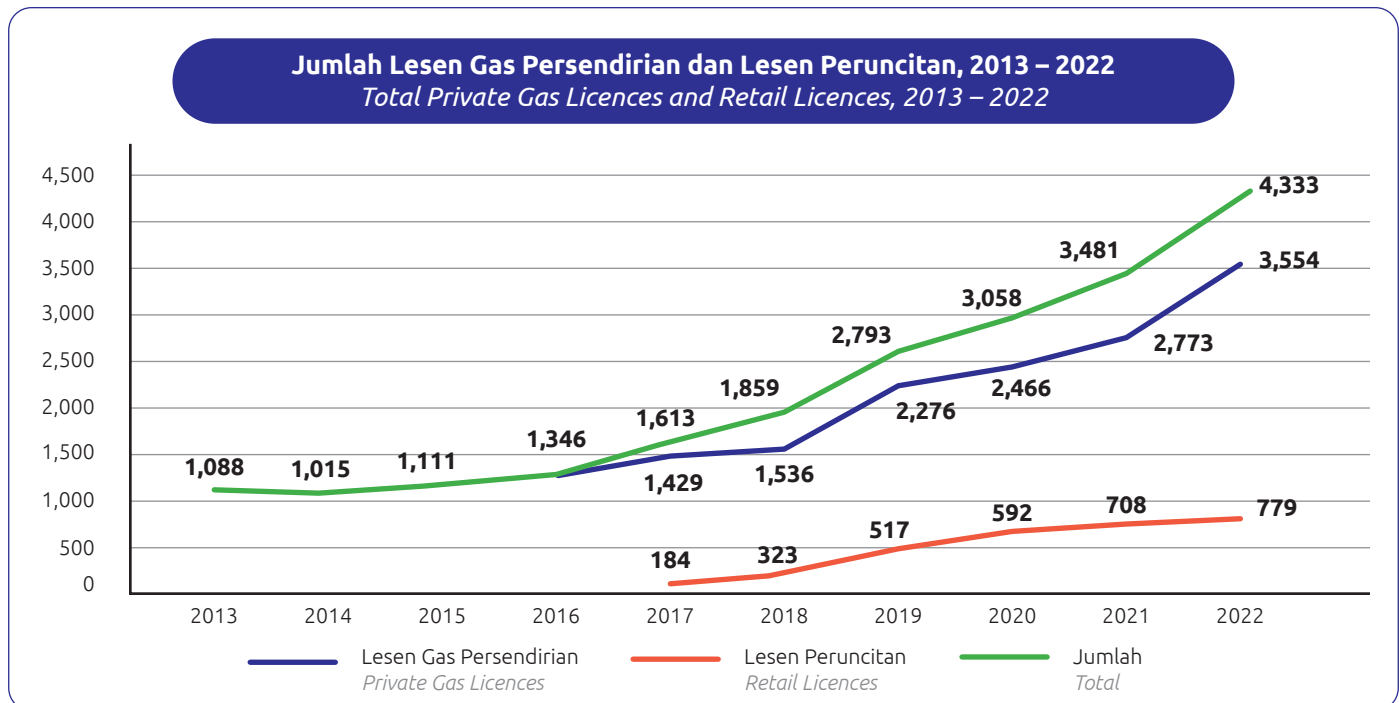


### Jumlah Lesen berkaitan Akses Pihak Ketiga, 2022 Total of Third-Party Access Licences, 2022

Kategori Lesen <i>Licence Category</i>	Jumlah <i>Total</i>
Lesen Pengimportan ke Terminal Penggasan Semula <i>Importation into Regasification Terminal Licence</i>	21
Lesen Penggasan Semula <i>Regasification Licence</i>	2
Lesen Pengangkutan <i>Transportation Licence</i>	4
Lesen Pengagihan <i>Distribution Licence</i>	3
Lesen Pengiriman <i>Shipping Licence</i>	16

Pada 2022 juga, ST telah mengeluarkan sejumlah 4,333 lesen gas persendirian dan lesen peruncitan sepertimana yang dikehendaki oleh Seksyen 11, Akta Bekalan Gas 1993. Ini merupakan penambahan sebanyak 852 berbanding tahun sebelumnya, disebabkan oleh peningkatan kesedaran pengguna serta orang awam tentang keperluan pelesenan gas terutama bagi memastikan keselamatan bersama.

Also, in 2022, the Commission issued a total of 4,333 private gas licences and retail licences as required by Section 11 of the Gas Supply Act 1993. This represented an increase of 852 licences compared to the previous year, attributed to the growing awareness among consumers and the public regarding the need for gas licensing, especially to ensure collective safety.



# Meningkatkan Bilangan Orang Kompeten Elektrik dan Gas

## Enhancing the Number of Electrical and Gas Competent Persons

### Perakuan Kekompetenan Elektrik

Pada 2022, sebanyak 5,156 Perakuan Kekompetenan telah dikeluarkan, di mana 261 (5%) Perakuan dikeluarkan melalui ST dan baki 4,895 (95%) dikeluarkan melalui institusi bertauliah di seluruh negara.

### Electrical Certificates of Competency

In 2022, a total of 5,156 Certificates of Competency were issued, with 261 (5%) Certificates issued by the Commission and the remaining 4,895 (95%) issued by certified institutions throughout the country.

### Statistik Pengeluaran Perakuan Kekompetenan, 2022

#### Statistics of Certificates of Competency Issued, 2022

Bil No	Kategori Utama Perakuan Kekompetenan Main Category of Certificates of Competency	Melalui ST By the Commission	Melalui Institusi Bertauliah By Accredited Institutions
1	Jurutera Perkhidmatan Elektrik (JPE) Electrical Services Engineer	1	-
2	Jurutera Elektrik Kompeten (JEK) Competent Electrical Engineer	28	-
3	Penyelia Elektrik (PE) Electrical Supervisor	2	-
4	Penjaga Jentera Elektrik (PJE) Electrical Chageman	198	2,206
5	Pencantum Kabel (PK) Cable Jointer	12	90
6	Pendawai Elektrik (PW) Electrical Wireman	20	2,599
<b>Jumlah Total</b>		261	4,895
<b>Jumlah Keseluruhan Total Number</b>		<b>5,156</b>	

Sehingga Disember 2022, sebanyak 120,999 Perakuan berstatus aktif dan 36,341 Perakuan berstatus tidak aktif. Perakuan berstatus tidak aktif adalah termasuk Perakuan yang lebih rendah bagi kategori yang sama dan pemegang Perakuan yang telah meninggal dunia.

As of December 2022, there were a total of 120,999 active Certificates and 36,341 inactive Certificates. Inactive Certificates include lower-level Certificates within the same category and Certificates held by individuals who have passed away.

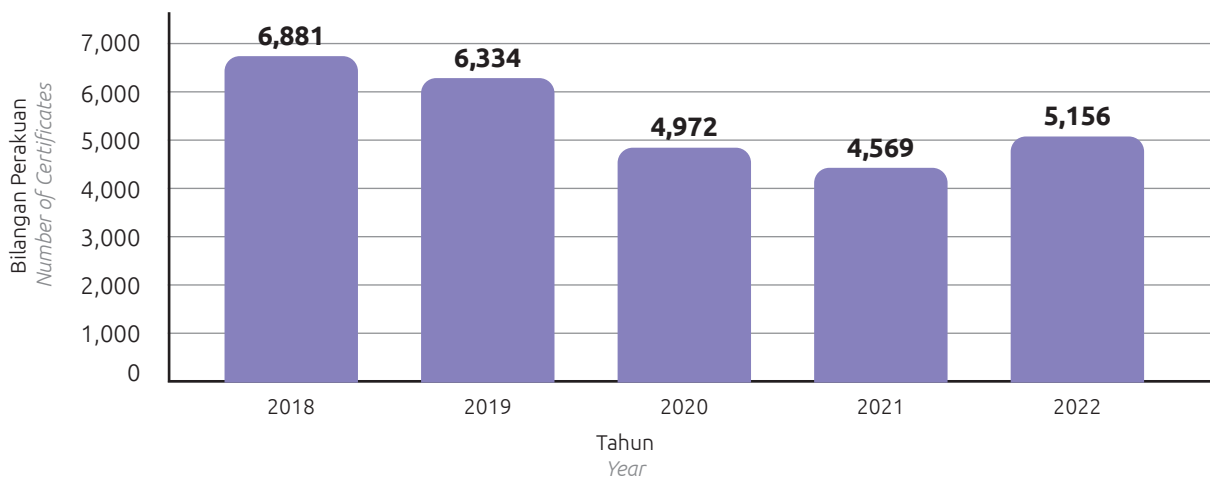
### Bilangan Perakuan Aktif dan Tidak Aktif Sehingga 2022 Number of Active and Inactive Certificates until 2022

Kategori Utama Perakuan Kekompetenan Main Category of Certificates of Competency	Perakuan Aktif Active Certificates	Perakuan Tidak Aktif Inactive Certificates
Jurutera Perkhidmatan Elektrik (JPE) Electrical Services Engineer	239	69
Jurutera Elektrik Kompeten (JEK) Competent Electrical Engineer	1,190	337
Penyelia Elektrik (PE) Electrical Supervisor	232	19
Penjaga Jentera Elektrik (PJE) Electrical Chargeman	48,931	18,371
Pencantum Kabel (PK) Cable Joints	739	284
Pendawai Elektrik (PW) Electrical Wireman	69,668	17,261
<b>Jumlah Keseluruhan Total Number</b>	<b>120,999</b>	<b>36,341</b>
<b>Peratusan Keseluruhan Total Percentage</b>	<b>76.9%</b>	<b>23.1%</b>

Pengeluaran Perakuan Kekompetenan pada 2022 meningkat sebanyak 12.85% berbanding 2021, disebabkan oleh dua (2) sesi pengendalian peperiksaan teori dijalankan bagi calon persendirian, berbanding hanya satu (1) sesi pada tahun sebelumnya.

The issuance of Certificates of Competency in 2022 increased by 12.85% compared to 2021, due to the implementation of two (2) theory examination sessions for private candidates, compared to only one (1) session in the previous year.

**Statistik Perbandingan Pengeluaran Perakuan Kekompetenan, 2018-2022**  
Comparison Statistics of Certificates of Competency Issuance, 2018-2022

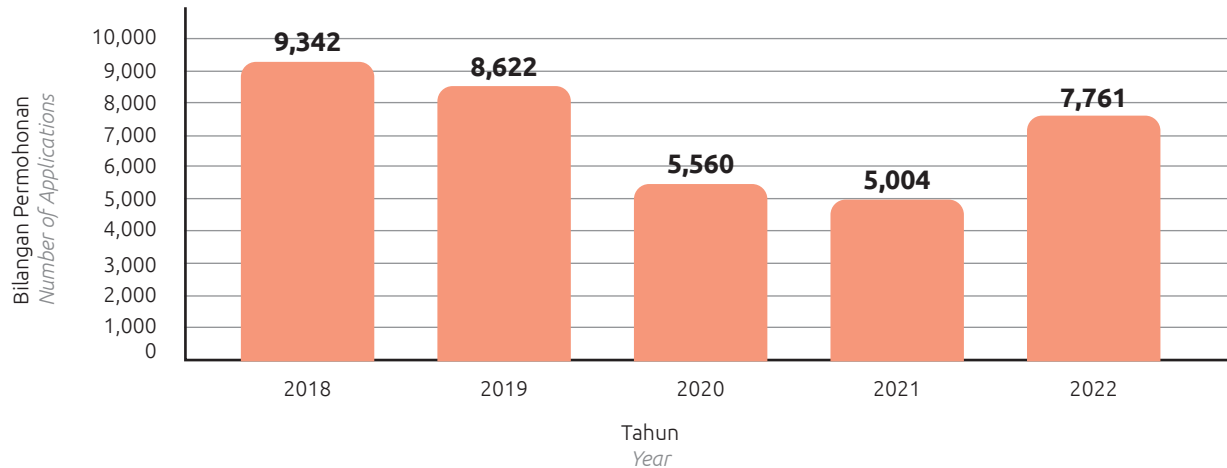


Permohonan baharu peperiksaan kekompetenan juga meningkat sebanyak 55.10% berbanding 2021. Peningkatan yang signifikan disebabkan oleh pembukaan semula permohonan peperiksaan kekompetenan kendalian institusi bertauliah pada 2022.

The number of new applications for competency examinations also increased by 55.10% compared to 2021. The significant increase was due to the reopening of applications for competency examinations conducted by certified institutions in 2022.



**Jumlah Permohonan Baharu Peperiksaan Kekompetenan, 2018-2022**  
*Total of New Applications for Competency Examinations, 2018-2022*



**Perakuan Kekompetenan Gas**

Pada 2022, ST telah mengeluarkan sebanyak 44 Perakuan Kekompetenan Gas.

***Gas Certificates of Competency***

*In 2022, ST issued a total of 44 Gas Certificates of Competency.*

**Statistik Pengeluaran Perakuan Kekompetenan Gas, 2022**  
*Statistics of Gas Certificates Competency Issued, 2022*

Bil No	Kategori Perakuan Kekompetenan <i>Category of Certificates of Competency</i>	Jumlah Total
1	Penyelia Kejuruteraan Gas <i>Gas Engineering Supervisor</i>	5
2	Jurugegas Gas Kelas I <i>Class I Gas Fitter</i>	8
3	Jurugegas Gas Kelas II <i>Class II Gas Fitter</i>	2
4	Jurugegas Gas Kelas III <i>Class III Gas Fitter</i>	29
<b>Jumlah Total</b>		<b>44</b>

Sehingga akhir 2022, terdapat seramai 1,208 pemegang Perakuan Kekompetenan Gas. Daripada jumlah tersebut, seramai 444 orang sahaja yang aktif dan berdaftar dengan ST sebagai Orang Kompeten dalam tahun semasa.

*As of the end of 2022, there were a total of 1,208 Gas Certificate of Competency holders. Out of this total, only 444 individuals were active and registered with the Commission as Competent Persons in the current year.*

## Bilangan Pemegang Perakuan Kekompetenan Gas Mengikut Kategori, 2022

*Number of Gas Certificate of Competency Holders by Category, 2022*

Kelas Kekompetenan <i>Class of Competency</i>	Bilangan <i>Number</i>	Aktif <i>Active</i>
Jurutera <i>Engineer</i>	87	28
Penyelia Kejuruteraan Gas <i>Gas Engineering Supervisor</i>	313	119
Jurugegas Gas Kelas I <i>Class I Gas Fitter</i>	300	157
Jurugegas Gas Kelas II <i>Class II Gas Fitter</i>	209	36
Jurugegas Gas Kelas III <i>Class III Gas Fitter</i>	299	104
<b>Jumlah <i>Total</i></b>	<b>1208</b>	<b>444</b>

Peperiksaan bertulis diadakan sebanyak dua (2) kali iaitu pada 8 Februari dan 26 Oktober 2022 dengan kehadiran seramai 20 calon. Peperiksaan lisan pula dijalankan sebanyak 20 sesi dan dihadiri oleh 47 calon. Daripada bilangan ini, seramai 22 calon telah lulus peperiksaan lisan dan layak diberikan Perakuan Kekompetenan Gas.

*Written examinations were conducted twice, on 8 February and 26 October 2022, with a total of 20 candidates in attendance. Oral examinations were conducted in 20 sessions and attended by 47 candidates. Out of this number, 22 candidates successfully passed the oral examination and were eligible to be awarded Gas Certificates of Competency.*

## Pentauliahn Kursus Baharu

Pada 2022, sebanyak 21 jenis kursus dan modul yang melibatkan 15 institusi bertauliah sedia ada telah mendapat kebenaran bagi mengendalikan kursus-kursus peperiksaan dan modul-modul kekompetenan elektrik ST. Bagi kekompetenan gas pula, tiada institusi baharu yang ditauliahkan pada 2022.

## Accreditation of New Courses

*In 2022, a total of 21 types of courses and modules involving 15 existing certified institutions were granted permission to conduct examination courses and competency modules in electrical competence by the Commission. However, for gas competency, no new institutions were accredited in 2022.*

## Senarai Insituti dan Kursus Pentauliahn, 2022

### *List of Accredited Institutions and Courses, 2022*

Bil <i>No</i>	Institusi <i>Institutions</i>	Kursus <i>Course</i>	Tarikh Tauliah <i>Accreditation Date</i>
1.	GM Hulu Selangor, Selangor	PW4 (FT/PT)	4 Mac 2022 / 4 March 2022
2.	ADTEC Kemaman, Terengganu	PJ A0 (PT)-Kursus 3 Tahun	4 Mac 2022 / 4 March 2022
3.	GM Tebrau, Johor	PW4 (FT/PT)	4 Mac 2022 / 4 March 2022
4.	BMI UniKL, Selangor	PJ B0 (33kV) – FT/PT	4 Mac 2022 / 4 March 2022
5.	INSTEP, Terengganu	Modul Kendalian Pencawang 11kV (PT)	4 Mac 2022 / 4 March 2022
6.	GM Tanah Merah, Kelantan	PW2 (FT/PT)	11 Ogos 2022 / 11 August 2022
7.	ILP Miri, Sarawak	PW4 (FT/PT)	11 Ogos 2022 / 11 August 2022
8.	ILP Mersing, Johor	PW4 (FT/PT)	11 Ogos 2022 / 11 August 2022

9.	KTKM Pasir Mas, Kelantan	PJ A4 (FT/PT)	11 Ogos 2022 / 11 August 2022
		Modul Janakuasa dengan Penyegerakkan VR (FT/PT)	11 Ogos 2022 / 11 August 2022
10.	IKTBN Alor Gajah, Melaka	PW4 (FT)	11 Ogos 2022 / 11 August 2022
11.	ILP Labuan	PW4 (FT)	11 Ogos 2022 / 11 August 2022
12.	IKM Beseri, Perlis	PW4 (FT) – Tambah Pelatih	11 Ogos 2022 / 11 August 2022
13.	GM Arau, Perlis	PW4 (FT/PT)	11 Ogos 2022 / 11 August 2022
14.	GM Prima Tasik Gelugor, PP	PJ A4 (FT/PT)	11 Ogos 2022 / 11 August 2022
		Modul Janakuasa dengan Penyegerakkan VR (PT)	11 Ogos 2022 / 11 August 2022
		PJ A1 (Kursus 2 Tahun FT)	11 Ogos 2022 / 11 August 2022
		Modul Talian Atas VR (PT)	11 Ogos 2022 / 11 August 2022
		PJ A0 (PT)	11 Ogos 2022 / 11 August 2022
		Modul Papan Suis Utama dan Kawalan Motor VR (PT)	11 Ogos 2022 / 11 August 2022
15.	IKM Kota Kinabalu, Sabah	PW4 (FT)	25 Oktober 2022 / 25 October 2022

Nota /Note: FT = Full Time | PT = Part Time | VR = Voltan Rendah/Low-Voltage

## Pengauditan di Institusi Bertauliah

Sehingga Disember 2022, sebanyak 140 buah institusi yang telah ditauliah oleh ST bagi mengendalikan peperiksaan kekompetenan elektrik ST. Bagi 2022 sahaja, sebanyak 17 institusi telah diaudit dan kadar pematuhan oleh setiap institusi adalah 100% dan isu-isu berbangkit daripada laporan audit telah diselesaikan pada Disember 2022.

Perkara-perkara yang diaudit termasuk program kursus yang sedang berjalan, kecukupan tenaga pengajar berkemampuan, tempoh kursus, sesi pengambilan, semakan borang permohonan peperiksaan, peralatan ujian dan pembelajaran dan kandungan silibus.

Bagi institusi yang ditauliahkan untuk mengendalikan peperiksaan kekompetenan gas pula, sebanyak dua (2) audit dijalankan iaitu IKM Johor Bahru pada 30 Jun 2022 dan UTM Skudai pada 19 Oktober 2022.

## Pendaftaran Orang Kompeten Gas

Pada 2022, terdapat seramai 444 pendaftaran Orang Kompeten Gas berbanding 434 pada 2021, iaitu peningkatan sebanyak 2%. Daripada jumlah ini, seramai 416 adalah pembaharuan dan 28 pula adalah pendaftaran baharu.

## Auditing at Certified Institutions

*As of December 2022, a total of 140 institutions have been accredited by the Commission to conduct the Commission's electrical competency examinations. In 2022 alone, 17 institutions were audited, and the compliance rate for each institution was 100%. Issues raised in the audit reports were resolved by December 2022.*

*The audit covered various aspects, including ongoing course programmes, adequacy of competent teaching staff, course duration, recruitment sessions, review of examination application forms, testing and learning equipment, and syllabus content.*

*For institutions accredited to conduct gas competency examinations, two (2) audits were conducted at IKM Johor Bahru on 30 June 2022 and UTM Skudai on 19 October 2022.*

## Registration of Gas Competent Persons

*In 2022, there were a total of 444 registrations for Gas Competent Persons, compared to 434 in 2021, representing a 2% increase. Out of this total, 416 were renewals, while 28 were new registrations.*



### Pendaftaran Orang Kompeten Gas, 2018-2022 Registration of Gas Competent Person, 2018-2022

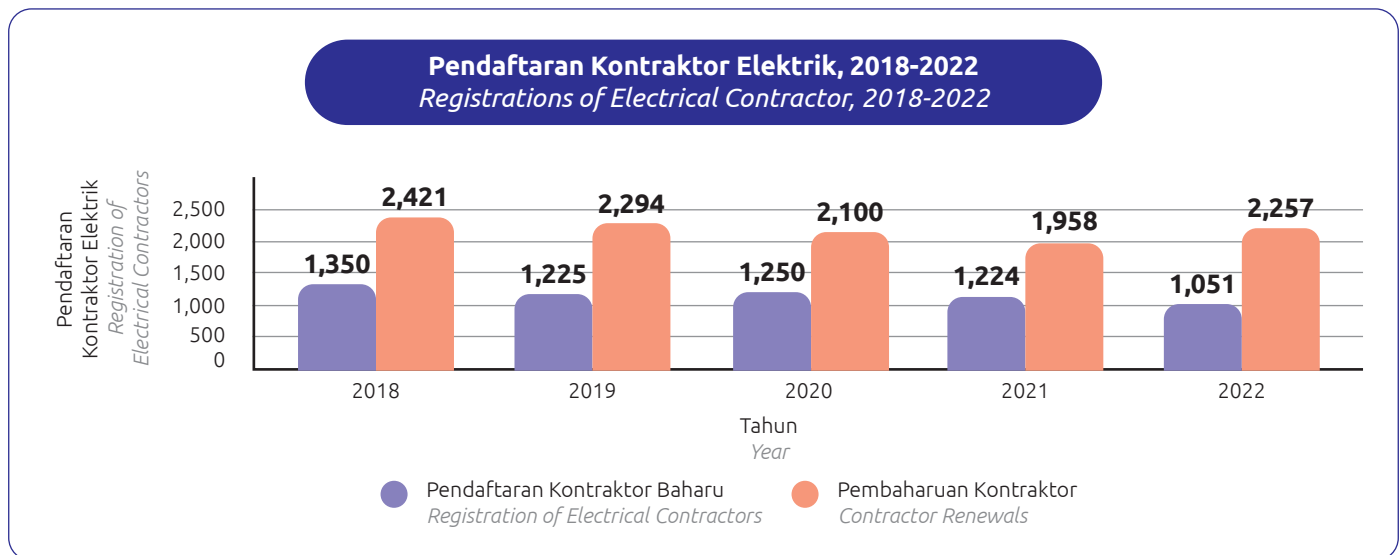
Kelas Kekompetenan Competency Class	Bilangan Orang Kompeten Gas Yang Berdaftar Number of Registered Gas Competent Persons									
	Pendaftaran Pembaharuan Registration Renewals					Pendaftaran Baharu New Registrations				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Jurutera Engineer	26	24	22	28	27	0	1	2	1	1
Penyelia Kejuruteraan Gas Gas Engineering Supervisor	109	101	105	116	114	1	6	11	0	5
Jurugegas Gas Kelas I Class I Gas Fitter	143	137	143	145	148	0	7	9	5	9
Jurugegas Gas Kelas II Class II Gas Fitter	28	42	89	27	35	85	3	1	3	1
Jurugegas Gas Kelas III Class III Gas Fitter	88	81	107	108	92	4	6	5	1	12
<b>Jumlah Total</b>	<b>394</b>	<b>385</b>	<b>466</b>	<b>424</b>	<b>416</b>	<b>90</b>	<b>23</b>	<b>28</b>	<b>10</b>	<b>28</b>

### Pendaftaran Kontraktor Elektrik

Pada 2022, seramai 1,051 kontraktor elektrik baharu mendaftar dengan ST, manakala 2,257 lagi memperbaharui pendaftaran kontraktor elektrik mereka. Walaupun jumlah pendaftaran baharu menurun jika dibandingkan dengan 2021, namun jumlah pembaharuan kontraktor didapati meningkat lebih 15%.

### Registration of Electrical Contractors

In 2022, a total of 1,051 new electrical contractors registered with the Commission, while another 2,257 renewed their electrical contractor registrations. Although the number of new registrations decreased compared to 2021, the number of contractor renewals increased by more than 15%.



## Pendaftaran Kontraktor Gas

Pada 2022, jumlah pendaftaran kontraktor gas meningkat kepada 121 berbanding 115 pada 2021. Daripada jumlah ini, 114 merupakan pendaftaran bagi pembaharuan dan baki tujuh (7) merupakan permohonan baharu. Peningkatan pendaftaran bilangan kontraktor ini disebabkan oleh sektor sosial dan ekonomi mula dibuka secara berperingkat selepas kes penularan COVID-19 menurun.

## Registration of Gas Contractors

In 2022, the number of gas contractor registrations increased to 121 compared to 115 in 2021. Out of this total, 114 were renewal registrations, while the remaining seven (7) were new applications. The increase in contractor registrations was attributed to the gradual reopening of the social and economic sectors following a decline in COVID-19 transmission.

### Pendaftaran Kontraktor Gas Mengikut Kelas, 2018-2022

#### Registration of Gas Contractors by Class, 2018-2022

Tahun Year	Kelas A Class A	Kelas B Class B	Kelas C Class C	Kelas D Class D	Jumlah Total
2018	47	35	24	5	111
2019	49	32	17	5	103
2020	52	36	20	7	115
2021	55	31	21	8	115
2022	58	36	20	7	121

## Perakuan Kelulusan Kelengkapan Elektrik dan Peralatan Gas

### Certificates of Approval for Electrical Equipment and Gas Appliances

#### Statistik Pengeluaran Perakuan Elektrik

##### Pengeluaran Perakuan Pendaftaran (PP)

Di bawah Peraturan 97C, Peraturan-peraturan Elektrik 1994, mana-mana syarikat yang mengilang atau mengimport kelengkapan elektrik hendaklah memohon Perakuan Pendaftaran (PP). Statistik menunjukkan pendaftaran bagi mengimport sama ada permohonan baharu dan permohonan pembaharuan adalah lebih tinggi berbanding mengilang iaitu masing-masing 83% dan 17%.

Perakuan Pendaftaran ini boleh dimohon secara dalam talian melalui sistem e-DIK (<https://edik.st.gov.my/>).

#### Statistics of Electrical Certification Issuance

##### Issuance of Certificate of Registration (CoR)

Under Regulation 97C of the Electrical Regulations 1994, any company that manufactures or imports electrical equipment is required to apply for a Certificate of Registration (CoR). Statistics show that the registration for importation, both for new applications and renewals, is higher compared to manufacturing, with 83% and 17% respectively.

This Certificate of Registration can be applied for online through the e-DIK system (<https://edik.st.gov.my/>).

## Jumlah Pengeluaran Perakuan Pendaftaran bagi Pengimport dan Pengilang, 2022

Total Issuance of Certificates of Registration for Importers and Manufacturers, 2022

### Permohonan Baharu New Application



Mengimport  
Imports

226

Mengilang  
Manufacturing

34

### Permohonan Pembaharuan Renewal Application



Mengimport  
Imports

411

Mengilang  
Manufacturing

95

### Pengeluaran Perakuan Kelulusan (PK) bagi Mengimport/Mengilang, Pameran dan Surat Pelepasan

Di bawah Peraturan 97(1), Peraturan-peraturan Elektrik 1994, Perakuan Kelulusan (PK) adalah diperlukan untuk aktiviti mengilang, mengimport, mempamer, menjual atau mengiklan kelengkapan elektrik. Jenis-jenis kelengkapan elektrik yang dikawal selia oleh ST adalah:

- i) apa-apa kelengkapan domestik
- ii) apa-apa kelengkapan voltan rendah yang biasanya dijual secara langsung kepada orang awam, atau
- iii) apa-apa kelengkapan voltan rendah yang tidak memerlukan kemahiran khusus dalam pengendaliannya.

PK diperlukan bagi memastikan kelengkapan elektrik yang berada di pasaran mematuhi standard keselamatan yang ditetapkan, sekaligus mengurangkan risiko kemalangan disebabkan oleh kelengkapan elektrik tersebut.

ST juga mengeluarkan Surat Pelepasan (RL) kepada pihak Kastam sebagai kelulusan pengecualian daripada PK untuk pengimportan kelengkapan elektrik yang dikawal selia oleh ST. Terdapat lapan (8) jenis surat pelepasan iaitu:

- i) Tujuan Khas
- ii) Konsert
- iii) Kajian Kilang
- iv) Kajian Kualiti
- v) Pembaikan dan Eksport Semula
- vi) Import Komponen untuk 100% Eksport

### Certification of Approval (CoA) for Import/Manufacture, Exhibition and Release Letter

Under Regulation 97(1) of the Electrical Regulations 1994, a Certification of Approval (CoA) is required for activities related to manufacturing, importing, displaying (exhibiting), selling, or advertising electrical equipment. The types of electrical equipment regulated by the Commission are:

- i) any domestic equipment
- ii) any low-voltage equipment which usually sold directly to the general public, or
- iii) any low-voltage equipment which does not require special skills in its operation.

The CoA is required to ensure that electrical equipment on the market complies with established safety standards, thereby reducing the risk of accidents caused by such electrical equipment.

The Commission also issued a Release Letter (RL) to the Customs as approval for exemption from the CoA for the importation of electrical equipment regulated by the Commission. There are eight (8) types of RL which are:

- i) Special Purpose
- ii) Concert
- iii) Factory Research
- iv) Quality Research
- v) Repair and Re-Export
- vi) Import Components for 100% Export
- vii) Import of Components for the Local Market
- viii) Transit Purpose

- vii) Import Komponen untuk Pasaran Tempatan
- viii) Transit

Sehingga kini, ST mengawal selia sebanyak 34 kategori kelengkapan elektrik. Bagi kelengkapan elektrik untuk tujuan pameran, ia tidak boleh dijual kepada orang awam dan perlu dikembalikan semula ke negara asal setelah pameran tamat.

*Presently, the Commission regulates 34 categories of electrical equipment. For electrical equipment for the purpose of the exhibition, it cannot be sold to the public and needs to be returned to the origin country after the exhibition ends.*

**Jumlah PK dan RL bagi Kelengkapan Elektrik, 2018–2022**  
*Total of CoA and RL for Electrical Equipment, 2018–2022*

Tahun Year	Perakuan Kelulusan (PK) Certification of Approval (CoA)			Jumlah Total	Pembaharuan PK Renewal of CoA		Jumlah Total	Surat Pelepasan (RL) Release Letter (RL)
	Import Import	Kilang Factory	Pameran Exhibition		Import Import	Kilang Factory		
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
2020	8,262	1,419	2	9,681	4,550	1,028	5,578	2,330
2021	8,789	1,176	0	9,965	4,941	1,162	6,103	2,621
2022	9,620	1,147	1	10,768	5,070	1,217	6,287	2,677

Selepas mendapat PK, kelengkapan elektrik yang diimport perlu menjalani ujian konsainmen atau menyertai *Product Certification Scheme (PCS)* oleh SIRIM. Kelengkapan yang lulus ujian konsainmen hendaklah dilekatkan dengan label Keselamatan ST-SIRIM.

*After obtaining the CoA, imported electrical equipment needs to undergo consignment testing or participate in the Product Certification Scheme (PCS) conducted by SIRIM. Equipment that passes the consignment testing shall be affixed with the ST-SIRIM Safety Label.*

**Label Keselamatan ST-SIRIM (BATCH) untuk Import**  
*ST-SIRIM label (BATCH) for Imported*



BAHARU (efektif Februari 2022)  
*NEW (effective February 2022)*



LAMA  
*OLD*

**Label Keselamatan ST-SIRIM untuk peralatan buatan tempatan dan import**  
*ST-SIRIM label for Locally Manufactured and Imported Equipment*



BAHARU (efektif Februari 2022)  
*NEW (effective February 2022)*



LAMA  
*OLD*

ST telah memperkenalkan label baharu keselamatan ST-SIRIM menggantikan label keselamatan ST-SIRIM yang lama bermula Mac 2022. Label baharu dengan tambahan ciri keselamatan kod QR disambungkan dengan info kelulusan kelengkapan dan info label merangkumi model, jenama dan lain-lain lagi. Para pengguna boleh menyemak info label dan kelulusan dengan menggunakan aplikasi SIRIM QAS untuk membuktikan bahawa kelengkapan ini betul dan mempunyai kelulusan.

*The Commission has introduced a new ST-SIRIM safety label to replace the old ST-SIRIM safety label starting from March 2022. The new label includes an additional safety feature, the QR Code, which is linked to information about the equipment's approval and label details such as model, brand, and more. Users can check the label information and approval status using the SIRIM QAS application to verify the authenticity and approval of the equipment.*

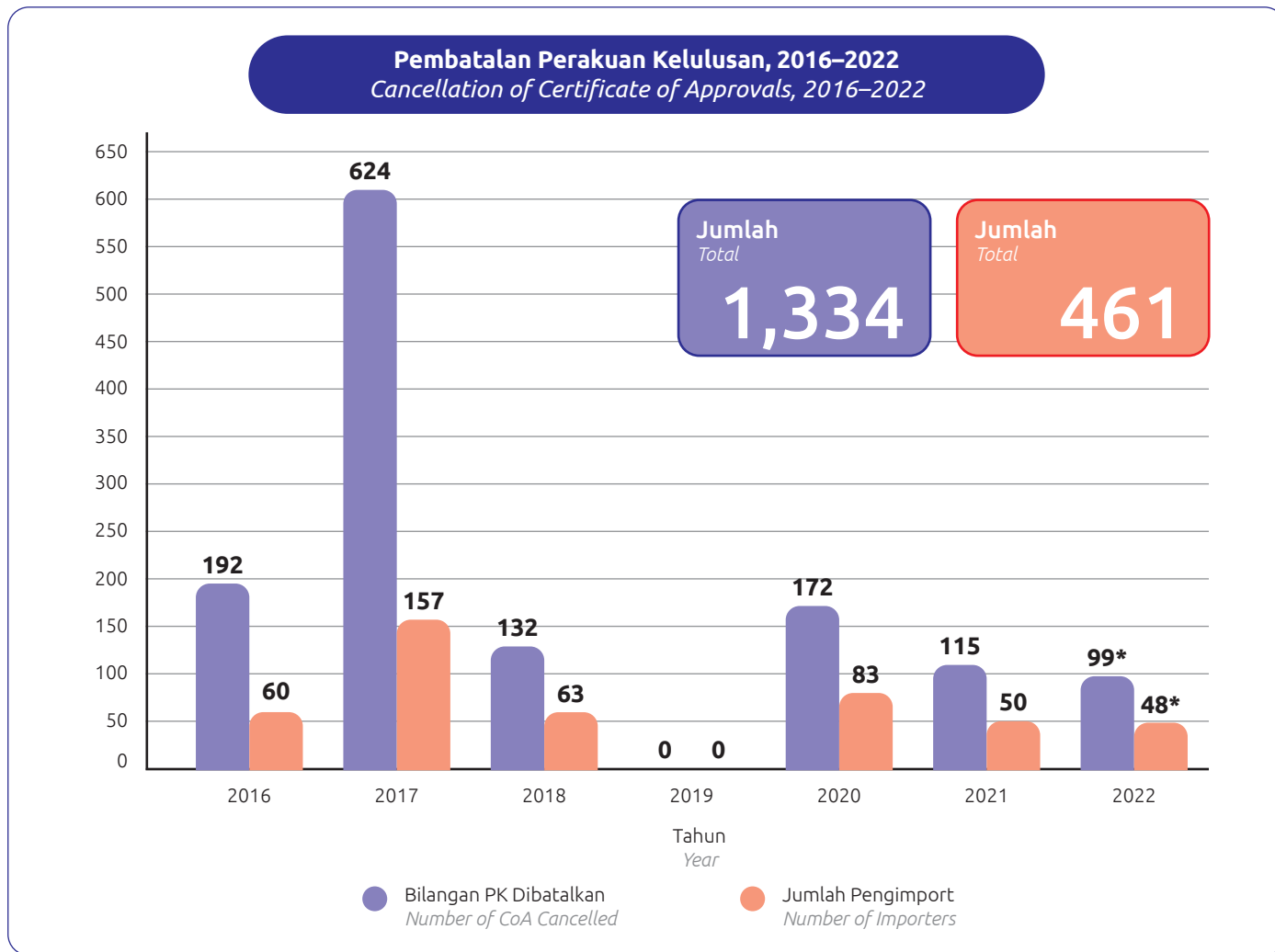


### Pembatalan PK yang Didapati Gagal Ujian Konsainmen SIRIM

Sehingga Disember 2022, sejumlah 22 kelompok pembatalan PK telah dipersetujui ST melibatkan 1,334 PK dan 461 syarikat pengimport. Bagi tahun 2022, tiada pembatalan PK telah dibuat, namun sebanyak 48 syarikat telah diberikan notis tunjuk sebab berkenaan kegagalan ujian konsainmen SIRIM tersebut yang melibatkan sebanyak 99 PK.

### Cancellation of Certificate of Approval (CoA) that Failed the SIRIM Consignment Test

As of December 2022, a total of 22 batches of CoA cancellations have been approved by the Commission, involving 1,334 CoAs and 461 importing companies. In 2022, no CoA cancellations were made, but 48 companies were issued show-cause notices for the failure of the SIRIM Consignment Test, involving 99 CoAs.



\* Diberi notis tunjuk sebab berkenaan kegagalan ujian konsainmen.  
 \*Given show-cause notices regarding the failure of the consignment test.

Antara sebab-sebab kegagalan ujian konsainmen SIRIM:

Among the reasons for failing the SIRIM Consignment tests were:

- **Isi kandungan laporan ujian diubah oleh pemohon**  
*Content of the test report was changed by the applicant*
- **Sampel yang diperiksa dan diuji amat berlainan daripada kelengkapan rujukan dalam laporan ujian**  
*Samples that were inspected and tested were different from the reference equipment in the test report*
- **Kelengkapan elektrik daripada batch yang berlainan untuk PK yang sama, mempunyai rupa bentuk dan reka bentuk yang berlainan**  
*Electrical equipment from a different batch but for the same CoA, with a different shape and design*
- **Penandaan pada plat nama atau label produk tidak memenuhi keperluan syarat penandaan dan amaran**  
*The markings on the nameplate or product label do not fulfil the marking requirements and warnings*
- **Manual pengguna tidak memenuhi syarat penandaan dan amaran**  
*The user manual does not fulfil the requirement of markings and warnings*
- **Kapasiti dan kadaran pada plat nama berlainan daripada yang telah diluluskan**  
*Capacity and rating on the nameplate are different from what is approved*
- **Komponen kritikal berlainan daripada yang tersenarai dalam laporan ujian**  
*Critical components different from what is listed in the test report*



Bagi kelengkapan elektrik yang telah gagal ujian konsainmen SIRIM, pengimport dikehendaki untuk memberikan maklum balas kepada ST berkenaan tindakan yang diambil terhadap kelengkapan tersebut. Antara tindakan yang diambil oleh pengimport adalah memohon semula PK dan ujian konsainmen SIRIM menggunakan laporan ujian keselamatan yang baharu, menghantar pulang ke negara asal serta melupuskan kelengkapan elektrik tersebut.

For electrical equipment that failed the SIRIM consignment test, importers are required to provide feedback to the Commission on actions taken to address the equipment's problems. Among actions taken by importers include re-applying for the CoA and SIRIM Consignment Test with a new safety test report, returning the equipment to its country of origin and disposing of the electrical equipment.



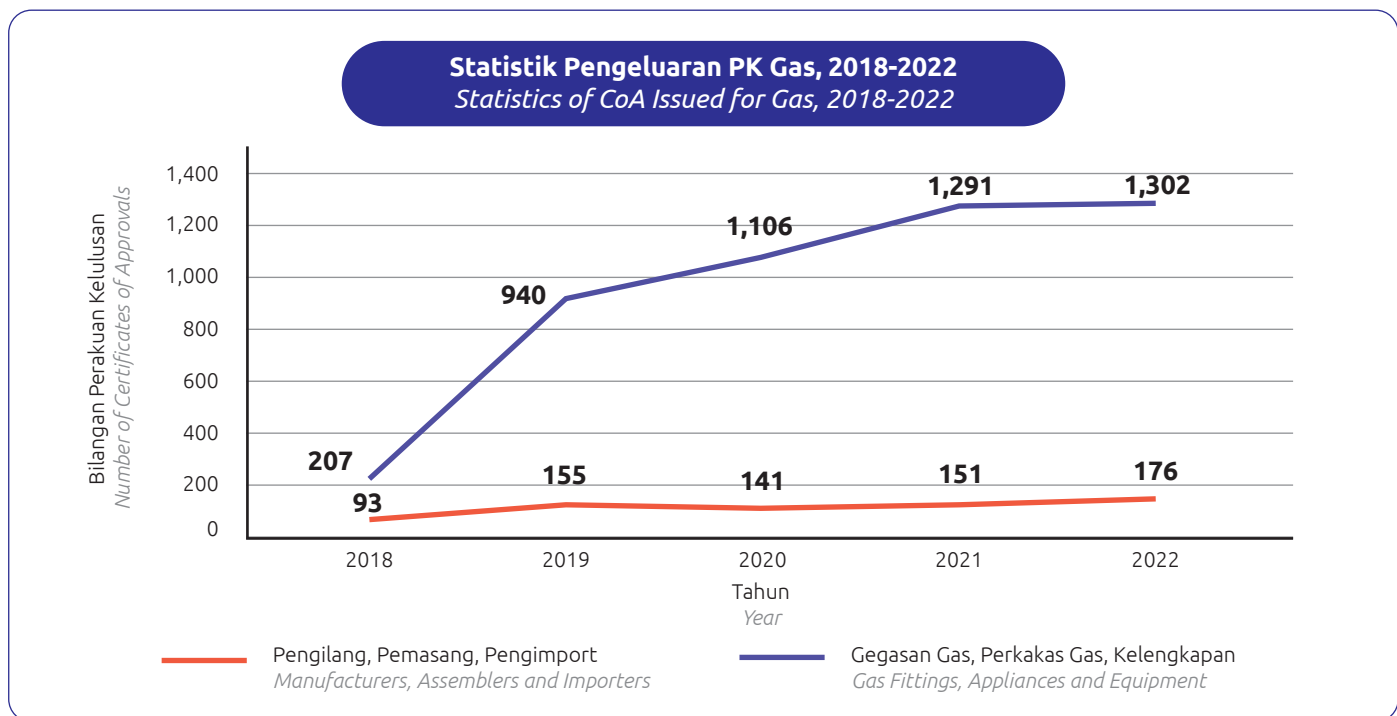
Kerja-kerja pelupusan kelengkapan elektrik yang gagal ujian konsainmen SIRIM.  
*Disposal works for electrical equipment that failed SIRIM's consignment testing.*

## PK Pengilang/Pemasang dan Pengimport & PK Gagasan Gas, Perkakas Gas dan Kelengkapan

Bagi 2022, sebanyak 176 PK Pengilang/Pemasang dan Pengimport dikeluarkan, peningkatan 16.55% berbanding tahun sebelumnya didorong oleh kerancakan semula sektor perniagaan selepas pandemik. Bagi Gagasan Gas, Perkakas Gas dan Kelengkapan pula, sebanyak 1,302 PK dikeluarkan melibatkan pelbagai jenis dan model, peningkatan 0.85% berbanding 2021. Ini disebabkan oleh sektor perniagaan masih dalam proses pemulihan serta ada Gagasan Gas, Perkakas Gas dan Kelengkapan yang tidak lagi diguna pakai oleh pengguna.

## CoA for Manufacturers, Assemblers and Importers & CoA for Gas Fittings, Gas Appliances and Equipment

In 2022, a total of 176 CoA for Manufacturers, Assemblers and Importers were issued, representing a 16.55% increase compared to the previous year, driven by the recovery of the business sector after the pandemic. For Gas Fittings, Gas Appliances and Equipment, a total of 1,302 CoA were issued involving various types and models, which is an increase of 0.85% compared to 2021. The slight increase can be attributed to the ongoing recovery process in the business sector and the discontinuation of some Gas Fittings, Gas Appliances and Equipment by users.



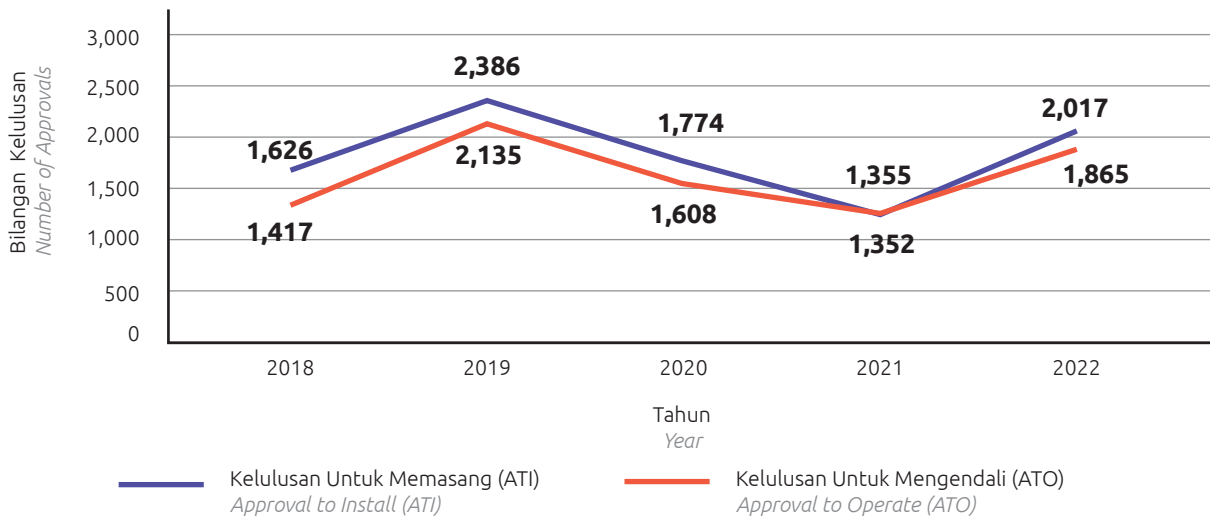
## Kelulusan untuk Memasang (ATI) dan Kelulusan untuk Mengendali (ATO) Pemasangan Gas Berpaip

Bagi 2022, permohonan ATI yang diterima adalah sebanyak 2,017, manakala permohonan ATO yang diterima adalah sebanyak 1,865. Jika dibandingkan dengan 2021, permohonan ATI dan ATO meningkat masing-masing sebanyak 48.9% dan 38%.

## Approval to Install (ATI) & Approval to Operate (ATO) for Piped Gas Installations

For 2022, a total of 2,017 ATI applications were received, while 1,865 ATO applications were received. Compared to 2021, ATI and ATO applications increased by 48.9% and 38%, respectively.

**Statistik Pengeluaran ATI dan ATO, 2018–2022**  
*Statistics of ATI and ATO Issued, 2018–2022*



## Meningkatkan Aktiviti Penguatkuasaan

### Enhancing Enforcement Activities

#### Penguatkuasaan

Sepanjang 2022, sebanyak 1,342 pemeriksaan dilaksanakan terhadap kontraktor elektrik, premis pengguna-pengguna industri kecil, komersial dan domestik termasuk kilang, hotel, pusat beli-belah dan kediaman, manakala audit pengurusan keselamatan elektrik dan gas telah dilaksanakan terhadap pemasangan elektrik dan gas yang besar.

Daripada pemeriksaan tersebut, sebanyak 421 notis pematuhan dikeluarkan kepada pemilik pemasangan yang didapati melanggar peruntukan undang-undang. Beserta dengan notis tersebut, satu format baharu telah diperkenalkan dengan melampirkan Akuan Pematuhan dengan memberi tempoh selama 14 hari supaya pelanggaran undang-undang dipatuhi.

#### Enforcement

Throughout 2022, a total of 1,342 inspections were conducted on electrical contractors and premises of small industries, commercial, and domestic users, including factories, hotels, shopping centres, and residences. Safety management audits for electrical and gas installations were also carried out on larger installations.

From these inspections, 421 compliance notices were issued to owners of installations found to be in violation of legal provisions. Along with the notices, a new compliance form was introduced, which includes a Statement of Compliance, providing a 14-day period for the rectification of the legal violations.



## Aktiviti Penguatkuasaan yang Dijalankan, 2022 *Enforcement Activities Conducted, 2022*

Bil No	Aktiviti Pemeriksaan <i>Inspection Activities</i>	Bilangan Pemeriksaan yang Dijalankan <i>Number of Inspections Conducted</i>	Bilangan Surat Pematuhan Keselamatan yang Dikeluarkan <i>Number of Safety Compliance Letters Issued*</i>
1.	Pemeriksaan Pemasangan/Pelesenan Elektrik <i>Installation Inspection/Electrical Licensing</i>	485 Premis <i>485 Premises</i>	196
2.	Pemeriksaan Pemasangan Gas (Keutamaan Kepada Dobi) <i>Gas Installation Inspection (Priority to Laundrettes)</i>	178 Premis <i>178 Premises</i>	62
3.	Pemeriksaan Pendaftaran Kontraktor <i>Registered Contractor Inspection</i>	205 Kontraktor <i>205 Contractors</i>	33
4.	Pemeriksaan Kelengkapan Elektrik (Pengimport/Pengilang/Pengedar/Penjual) <i>Electrical Appliances Inspection (Importers/Manufacturers/Distributors/Sellers)</i>	260 Premis <i>260 Premises</i>	89
5.	Pemeriksaan Pengurus Tenaga Elektrik <i>Electrical Energy Manager Inspection</i>	65 Premis <i>65 Premises</i>	5
6.	Audit Program/Plan Pengurusan Keselamatan <i>Audit Programmes/Safety Management Plans</i>	149 Premis <i>149 Premises</i>	36

\* Bilangan Surat Pematuhan Keselamatan yang dikeluarkan adalah tertakluk kepada bilangan ketidakpatuhan yang dijumpai sewaktu pemeriksaan dilakukan dan tidak bergantung kepada bilangan premis yang diperiksa.

\* *The number of Safety Compliance Letters issued is subject to the number of non-compliances found during inspections and not the number of premises inspected.*

Pada 2022, ST menjalankan operasi penguatkuasaan yang telah mengenal pasti 80 premis yang disyaki melanggar peraturan dan undang-undang berkaitan. Berikutan operasi tersebut, ST telah membuka 59 Kertas Siasatan bagi setiap kategori operasi yang dilakukan.

*In 2022, the Commission conducted enforcement operations that identified 80 premises suspected of violating regulations and laws. As a result of these operations, ST opened 59 Investigation Papers for each category of operation conducted.*

## Operasi Penguatkuasaan yang Dilaksanakan, 2022 *Enforcement Operations Conducted, 2022*

Operasi <i>Operation</i>	Bil No	Bilangan Kertas Siasatan Dibuka <i>Number of Investigation Papers Opened</i>
Penguatkuasaan Penggunaan Elektrik Dengan Curang <i>Enforcement of the Dishonest Use of Electricity</i>	18	10
Penguatkuasaan Pemasangan Gas <i>Enforcement of Gas Installations</i>	2	2
Penguatkuasaan Pemasangan Lesen (Persendirian, Awam, NEM) <i>Enforcement of Licensing Installations (Private, Public, NEM)</i>	60	47
<b>Jumlah <i>Total</i></b>	<b>80</b>	<b>59</b>

### Penyiasatan

Pada 2022, Mesyuarat Jawatankuasa Siasatan telah dijalankan bagi menganalisis, mengkaji, menyemak dan menilai semua 139 kes yang dilaporkan. Daripada 139 kes tersebut, sebanyak 70 Kertas Siasatan diluluskan untuk dibuka, 29 kes memerlukan siasatan lanjut dan 40

### Investigation

*In 2022, the Investigation Committee Meetings were conducted to analyse, assess, review, and evaluate all 139 reported cases. Out of the 139 cases, a total of 70 Investigation Papers were approved to be opened, 29 cases required further investigation, and 40 cases did not*

kes tidak mempunyai asas yang kukuh untuk diteruskan siasatan. Lanjutan daripada Mesyuarat tersebut, ST juga bertanggungjawab menilai 154 Kertas Siasatan bagi kesemua kategori kes, termasuk kes-kes yang dilaporkan sebelum 2022.

*have sufficient basis to proceed with the investigation. As a continuation of the Meetings, the Commission also took responsibility for assessing 154 Investigation Papers for all categories of cases, including cases reported prior to 2022.*

**Kategori Kes yang Disiasat dan Dibuka Kertas Siasatan, 2022**  
*Categories of Cases Investigated and Investigation Papers Opened, 2022*

<b>Kategori Kes Kertas Siasatan Dibuka</b> <i>Categories of Investigation Papers Opened</i>			
<b>Kategori</b> <i>Category</i>	<b>2021</b>	<b>2022</b>	
Kemalangan Elektrik Maut <i>Fatal Electrical Accidents</i>	20	23	
Kemalangan Elektrik Tidak Maut <i>Non-Fatal Electrical Accidents</i>	20	31	
Kemalangan Maut (Haiwan) <i>Fatal Accidents (Animals)</i>	5	8	
Kemalangan Maut Bukan Elektrik <i>Non-Electrical Fatal Accident</i>	0	1	
Kemalangan Tidak Maut Bukan Elektrik <i>Non-Fatal Non-Electrical Accidents</i>	4	2	
Kes Kebakaran Elektrik <i>Electrical Fire Cases</i>	1	2	
Gangguan Bekalan Elektrik <i>Electrical Supply Interruptions</i>	2	1	
Aduan dari Unit Hal Ehwal Pengguna <i>Complaints from Consumer Affairs Unit</i>	1	0	
Kemalangan Gas Maut <i>Fatal Gas Accidents</i>	0	0	
Kemalangan Gas Tidak Maut <i>Non-Fatal Gas Accidents</i>	1	1	
Kebocoran Gas <i>Gas Leakage</i>	0	1	
Operasi Curi Elektrik <i>Electricity Theft Operations</i>	3	16	
Operasi Kelengkapan Elektrik <i>Electrical Equipment Operations</i>	1	4	
Operasi Pemasangan Elektrik <i>Electricity Installation Operations</i>	1	0	
Operasi Orang Kompeten <i>Competent Person Operations</i>	1	0	
Lesen (Awam/Persendirian/NEM) <i>Licences (Public/Private/NEM)</i>	46	62	
Operasi Pemasangan Gas <i>Gas Installation Operations</i>	1	2	
<b>Jumlah</b> <i>Total</i>	<b>107</b>	<b>154</b>	

Penyumbang terbesar bagi kenaikan jumlah Kertas Siasatan pada 2022 adalah bagi kategori Kes Lesen di mana terdapat 62 kes lesen disiasat menjurus

*The largest contributor to the increase in the number of Investigation Papers in 2022 is the Licence category, with 62 licence cases investigated related to non-compliance*

kepada ketidakpatuhan Seksyen 9 Akta Bekalan Elektrik iaitu premis beroperasi tanpa lesen (NEMS) dan ketidakpatuhan Seksyen 37 (5) ABE 1990 iaitu membekalkan elektrik tanpa lesen.

## Pendakwaan dan Pengkompaunan

Untuk 2022, beberapa inisiatif diambil untuk meningkatkan tindakan perundangan ke atas kes ketidakpatuhan serta menambah baik proses pengeluaran kompaun dan semakan kertas siasatan. Ia termasuk:

- Projek *Dragon* untuk menyelesaikan pendakwaan dan kompaun kertas siasatan tertunggak
- Program libat urus bersama Jabatan Peguam Negara setiap bulan untuk menghantar kertas siasatan bagi tujuan izin dakwa atau kompaun
- Bengkel penyiasatan bersama Polis Diraja Malaysia (PDRM) untuk mengenal pasti isu-isu berkaitan penguatkuasaan, penyiasatan dan pendakwaan bagi kes-kes curi elektrik yang melibatkan perlombongan *bitcoin*
- Menyemak semula format dan proses pengeluaran kompaun bagi memastikan ia mengikut akta dan peraturan
- Menyemak semula prosedur ISO 9001 bagi proses kerja pendakwaan

*with Section 9 of the Electricity Supply Act, which involves premises operating without a licence (NEMS), and non-compliance with Section 37 (5) ABE 1990, which pertains to supplying electricity without a licence.*

## Prosecution and Compound

*For 2022, several initiatives were taken to enhance legal actions on cases of non-compliance and improve the process of issuing compounds and reviewing investigation papers for non-compliance cases. These initiatives include:*

- *Dragon Project to expedite prosecution and settlement of outstanding investigation paper compounds*
- *Engagement programmes with the Attorney General's Chambers on a monthly basis to submit investigation papers for prosecution approval or compounds*
- *Joint investigation workshops with the Royal Malaysia Police (RMP) to address enforcement, investigation, and prosecution issues related to electricity theft cases involving bitcoin mining*
- *Reviewing the format and process of issuing compounds to ensure compliance with relevant acts and regulations*
- *Reviewing the ISO 9001 procedures for the prosecution workflow process*

Jumlah Kertas Siasatan  
Dirujuk ke Jabatan  
Peguam Negara

Total Investigation Papers  
Referred to the Attorney  
General's Chamber

510

Jumlah Kes  
Pendakwaan  
Total Prosecution  
Cases

13

Jumlah  
Kompaun  
Total  
Compounds

83

Jumlah Kompaun yang telah Dibayar  
Compound Paid

RM206,500.00

Lebih 50% Kertas Siasatan yang diterima pada 2022 telah lengkap dengan tindakan, manakala semua kes ketidakpatuhan yang tertanggung dan memerlukan tindakan perundangan diselesaikan dan dikemukakan kepada Jabatan Peguam Negara. Keputusan kes dan kesalahan turut dipaparkan di dalam laman web ST.

*Over 50% of the Investigation Papers received in 2022 have been completed with appropriate actions, while all pending non-compliance cases requiring legal action have been resolved and submitted to the Attorney General's Chambers. The outcomes of these cases and the offences are also displayed on the Commission's website.*

# Sorotan Utama

## Main Highlights

### Kerjasama ST Bersama Jabatan Kastam Diraja Malaysia (JKDM)

Sepanjang 2022, ST turut bekerjasama dengan Jabatan Kastam Diraja Malaysia (JKDM) bagi menjalankan operasi berkaitan kelengkapan elektrik. Sebanyak tiga (3) operasi dilaksanakan termasuk di gudang syarikat di Petaling Jaya, Selangor, di mana sebanyak 2,755 unit kelengkapan elektrik yang dianggarkan bernilai RM1.4 juta telah dirampas kerana tidak mempunyai PK dan label keselamatan ST-SIRIM.

Dalam pemeriksaan ke atas sebuah kontena yang berisi dagangan dari India di kawasan Pejabat Kastam Bahagian Penguatkuasaan Seremban 2, sejumlah dagangan jenis *mixer grinder* disyaki tidak mempunyai kelulusan permit import. Hasil semakan mendapati semua kelengkapan yang diimport oleh syarikat tersebut tidak mempunyai PK. Oleh itu pihak JKDM merampas 800 unit kelengkapan elektrik berkenaan yang dianggarkan bernilai lebih RM100,000.

Dalam lawatan ke gudang di Kawasan Perindustrian Bukit Raja, Klang, Selangor pula, semakan mendapati kelengkapan elektrik berkenaan tidak mempunyai PK dan label keselamatan ST-SIRIM. Kelengkapan ini juga didapati tidak selamat kerana tidak melalui proses permohonan PK dan diuji di makmal yang diiktiraf oleh ST. Pihak JKDM masih menjalankan siasatan lanjut dan terperinci berkenaan barang yang diimport oleh syarikat berkenaan.

### Penguatkuasaan Penggunaan Elektrik Secara Curang

Pada 2022, sebanyak 18 operasi membanteras penggunaan elektrik secara curang atau lebih dikenali sebagai 'curi elektrik' yang melibatkan pelbagai agensi telah dilaksanakan. Operasi serbuan yang dijalankan tidak hanya tertumpu kepada aktiviti perlombongan *bitcoin* tetapi juga terhadap premis-premis komersial.

### *Collaboration between the Commission and the Royal Malaysian Customs Department (RMCD)*

*Throughout 2022, the Commission also collaborated with the Royal Malaysian Customs Department (RMCD) to carry out operations related to electrical equipment. Three (3) operations were conducted, including one at a company warehouse in Petaling Jaya, Selangor. During this operation, a total of 2,755 units of electrical equipment, estimated to be worth RM1.4 million, were seized due to the lack of Certificate of Approval (CoA) and ST-SIRIM safety labels.*

*In an inspection of a container containing goods from India at the Customs Office of Enforcement Division Seremban 2, several units of mixer grinders were suspected of lacking import permits. Upon examination, it was found that all the imported equipment by the company did not possess CoA. As a result, RMCD seized 800 units of the respective electrical equipment, estimated to be worth over RM100,000.*

*During a visit to a warehouse in the Bukit Raja Industrial Area, Klang, Selangor, it was discovered that the electrical equipment did not have CoA and ST-SIRIM safety labels. This equipment was also found to be unsafe as it did not undergo the necessary CoA application process and testing in the Commission's accredited laboratories. RMCD is still conducting further and detailed investigations into the imported goods by the respective company.*

### *Enforcement of the Dishonest Use of Electricity*

*In 2022, a total of 18 operations were carried out to combat the dishonest use of electricity, more commonly known as "electricity theft", involving various agencies. The conducted raids were not only focused on bitcoin mining activities but also targeted commercial premises.*



Pemegang lesen boleh menuntut semula kerugian hasil akibat aktiviti penggunaan elektrik secara curang, manakala ST memantau semua tindakan yang diambil oleh pemegang lesen di bawah Seksyen 38 Akta Bekalan Elektrik 1990 [Akta 447].

Bagi sambungan haram di Sabah, ST turut sama bekerjasama membanteras aktiviti sambungan haram yang dilaksanakan oleh PBT dan SESB.

*Licensees can seek restitution for losses incurred as a result of electricity theft activities, while the Commission monitors all actions taken by the licensees under Section 38 of the Electricity Supply Act 1990 [Act 447].*

*In the case of illegal connections in Sabah, the Commission also collaborated with PBT and SESB to combat illegal connection activities.*

## Kaedah Penggunaan Elektrik Secara Curang, 2022 Method of Dishonest Use of Electricity Operations, 2022

12

### Sambungan terus tanpa melalui meter

*Direct connection without passing through the meter*

1

### Pintasan pada terminal kemasukan fasa kuning dan biru

*Bypass on the input terminal of the yellow and blue phases*

1

### Voltage link meter pada fasa kuning telah diusik

*Tampering with the voltage link meter on the yellow phase*

1

### Pintasan pada Test Terminal Block menggunakan clamp

*Bypass on the Test Terminal Block using a clamp*

1

### Kabel pintasan dari kabel kemasukan terus busbar pengguna tanpa melalui meter

*Bypass on the incoming cable directly to the user's busbar without passing through the meter*

2

### Tiada kejanggalan

*No irregularity*

Antara usaha ST untuk mengekang aktiviti penggunaan elektrik secara curang melibatkan perlombongan bitcoin adalah bekerjasama dengan Pusat Pencegahan Jenayah Kewangan Nasional (NFCC) dalam menjalankan operasi serbuan bersepadu. Operasi bersepadu ini disertai oleh ST sebagai ketua operasi dan dibantu oleh TNB, PDRM dan NFCC. Melalui operasi bersepadu ini, agensi penguatkuasaan yang lain juga boleh mengambil tindakan di bawah perundangan masing-masing seperti Kanun Keseksaan [Akta 575] dan Akta Pencegahan Pengubahan Wang Haram dan Pencegahan Pembiayaan Keganasan, 2001 [Akta 613].

*Among the Commission's efforts to curb the dishonest use of electricity for bitcoin mining is collaborating with the National Financial Crime Prevention Centre (NFCC) to conduct integrated raid operations. The Commission led the operation, with support from TNB, RMP, and NFCC. Through these integrated operations, other enforcement agencies can also take action under their respective legislation, such as the Penal Code [Act 575] and the Anti-Money Laundering, Anti-Terrorism Financing and Proceeds of Unlawful Activities Act 2001 [Act 613].*

## Majlis Penganugerahan Sijil Pentauliah Institusi & Perakuan Kekompetenan ST oleh Menteri Tenaga dan Sumber Asli

Majlis Penganugerahan Sijil Pentauliah Institusi dan Perakuan Kekompetenan ST ini diadakan bagi mengiktiraf dan menghargai institusi yang ditauliah oleh ST dalam melaksanakan kursus dan peperiksaan kekompetenan khususnya bagi Pendawai Elektrik (PW), Penjaga Jentera Elektrik (PJE) dan Pencantum Kabel (PK). Program-program ini beraspirasi mendidik dan mempromosikan keselamatan elektrik kepada para pelajar bagi melahirkan lebih ramai Orang Kompeten elektrik yang bukan sahaja berpengetahuan, berkemahiran malah berkualiti di pasaran negara.

Inisiatif ini juga selari dengan fungsi ST di bawah Akta Suruhanjaya Tenaga 2001 [Akta 610] untuk memantau dan mengaudit institusi latihan bertauliah serta meluluskan perakuan Orang Kompeten elektrik. Ini adalah bagi memastikan institusi-institusi latihan mematuhi semua syarat pentauliah yang ditetapkan ST di samping memastikan Orang Kompeten peka akan amalan-amalan selamat, khususnya dalam bidang elektrik.

Inisiatif ini dirancang untuk dilaksanakan secara berterusan, selaras dengan Dasar Tenaga Negara 2022-2040 bagi menjamin bekalan tenaga, kemampanan alam sekitar dan kemakmuran Malaysia selain menggalak daya saing dan inovasi dalam industri serta merencanakan pertumbuhan ekonomi negara.

## *The Commission's Institutional Certificate of Accreditation & Certificate of Competency Awards Ceremony by the Minister of Energy and Natural Resources*

*The Institutional Certificate of Accreditation and Certificate of Competency Awards Ceremony is held to recognise and appreciate institutions accredited by the Commission for conducting courses and competency examinations, particularly for Electrical Wiremen, Electrical Chargemen, and Cable Jointers. These programmes aspire to educate and promote electrical safety among students, thereby producing a larger number of electrical Competent Persons who possess not only knowledge and skills, but also quality in the national market.*

*This initiative is also in line with the Commission's functions under the Suruhanjaya Tenaga Act 2001 [Act 610] to monitor and audit accredited training institutions and issue certifications for electrical Competent Persons. This is to ensure that training institutions comply with all the accreditation requirements set by the Commission, as well as to ensure that Competent Persons are knowledgeable about safe practices, particularly in the field of electricity.*

*This initiative is planned to be implemented continuously, in line with the National Energy Policy 2022-2040, to ensure energy supply, environmental sustainability, and the prosperity of Malaysia. It also aims to encourage competitiveness and innovation in the industry and promote economic growth in the country.*

### **Penerima Sijil Kebenaran Mengendalikan Kursus Kekompetenan (Pentauliah)** *Recipients of the Certificate of Authorisation to Conduct Competency Courses (Accreditation)*

<b>Bil No</b>	<b>Institusi Institutions</b>	<b>Kategori Pentauliah Category of Accreditation</b>
1.	Kolej Kemahiran Tinggi MARA (KKTM) Pasir Mas	Penjaga Jentera A4 Electrical Chargeman A4
2.	Kolej Kemahiran Tinggi MARA (KKTM) Pasir Mas	Modul Janakuasa Voltan Rendah Dengan Penyegerakan Low-voltage Power with Synchronisation Module
3.	GIATMARA Tanah Merah	Pendawai Fasa Tunggal Dengan Endorsan Pengujian (PW2) Single Phase Wireman with Testing Endorsement (PW2)

**Penerima Perakuan Kekompetenan Pendawai dan Penjaga Jentera**  
*Recipients of Certification of Competency for Wireman and Chargeman*

<b>Bil No</b>	<b>Institusi Institutions</b>	<b>Kategori Kekompetenan Category of Competency</b>
1.	Institut Latihan Perindustrian (ILP) Kota Bharu	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A0 <i>Chargeman A0</i>
2.	Kolej Kemahiran Tinggi MARA (KKTM) Pasir Mas	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A0 <i>Chargeman A0</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
3.	Institut Kemahiran MARA (IKM) Lumut	Pendawai PW2 <i>Wireman PW2</i>
		Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
4.	IKM Pekan	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
5.	IKM Sik	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
6.	IKM Sungai Petani	Pendawai PW2 <i>Wireman PW2</i>
		Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A0 <i>Chargeman A0</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
7.	IKM Seberang Prai Utara	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
		Penjaga Jentera A4 <i>Chargeman A4</i>
8.	IKM Kuala Lumpur	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
9.	IKM Jasin	Penjaga Jentera A4 <i>Chargeman A4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
10.	IKM Kota Kinabalu	Pendawai PW4 <i>Wireman PW4</i>
		Penjaga Jentera A1 <i>Chargeman A1</i>
11.	IKM Kuching	Pendawai PW4 <i>Wireman PW4</i>
12.	IKM Bintulu	Penjaga Jentera A1 <i>Chargeman A1</i>

## **Mesyuarat *Joint Regulatory Advisory Committee (JRAC) on Electrical and Electronic Equipment***

*Joint Regulatory Advisory Committee (JRAC) ditubuhkan oleh anggota ekonomi Asia-Pacific Economic Cooperation (APEC) di bawah Committee on Trade & Investment (CTI) dan Sub-committee on Standards and Conformance (SCSC) Electrical and Electronic Equipment Mutual Recognition Agreement (EEMRA).*

Objektif penubuhan JRAC adalah untuk saling menerima dan mengiktiraf pematuhan penilaian bagi memudahkan perdagangan kelengkapan elektrik dan elektronik di antara anggota ekonomi APEC. Selain itu, ia juga merupakan platform untuk perkongsian mengenai prosedur, proses dan kawal selia kelengkapan elektrik dan elektronik dan perkembangan terkini antara anggota ekonomi APEC.

Pada 2022, mesyuarat JRAC diadakan secara maya sebanyak dua (2) kali iaitu pada 14 Februari dan 18 Ogos. Pada mesyuarat ke-28, pihak International Electrotechnical Commission (IEC) memaklumkan mengenai tambahan baharu anggota ahli ekonomi iaitu Somalia dan Timor Leste, menjadikan jumlah keahlian IEC sebanyak 174 ekonomi.

Pada mesyuarat ke-29 pula, Malaysia berkongsi mengenai tambahan kategori kelengkapan elektrik yang dikawal selia, daripada 31 kategori kepada 34 kategori. Selain itu, kelengkapan cekap tenaga yang dikawal adalah sebanyak lapan (8) kelengkapan iaitu televisyen, peti sejuk, lampu, penyaman udara, mesin basuh, kipas, periuk nasi dan ketuhar gelombang mikro.

## **Mesyuarat *Joint Sectoral Committee for Electrical and Electronic Equipment (JSC EEE)***

*Joint Sectoral Committee for Electrical and Electronic Equipment (JSC EEE) adalah jawatankuasa yang memantau dan melaksanakan Mutual Recognition Agreement (MRA) Sektor ASEAN untuk kelengkapan Elektrik dan Elektronik (ASEAN EE MRA) dan ASEAN Harmonised Electrical and Electronic Equipment Regulatory Regime (AHEEERR). MRA mewajibkan ahli menerima keputusan ujian dan pensijilan yang*

## ***Joint Regulatory Advisory Committee (JRAC) on Electrical and Electronic Equipment Meeting***

*The Joint Regulatory Advisory Committee (JRAC) was established by economic members of the Asia-Pacific Economic Cooperation (APEC) under the Committee on Trade & Investment (CTI) and Sub-committee on Standards and Conformance (SCSC) Electrical and Electronic Equipment Mutual Recognition Agreement (EEMRA).*

*The objective of JRAC is to mutually accept and recognise compliance assessments to facilitate the trade of electrical and electronic equipment among APEC economic members. Furthermore, it also serves as a platform for sharing information on procedures, processes, and regulatory control of electrical and electronic equipment, as well as the latest developments among APEC economic members.*

*In 2022, the JRAC meetings were conducted virtually twice, on 14 February and 18 August. During the 28<sup>th</sup> meeting, the International Electrotechnical Commission (IEC) announced the addition of two new economic members, Somalia and Timor-Leste, bringing the total IEC membership to 174 economies.*

*In the 29<sup>th</sup> meeting, Malaysia shared about the addition of three more categories of regulated electrical equipment, increasing the total from 31 to 34 categories. Additionally, there were eight (8) energy-efficient controlled electrical appliances, namely television, refrigerator, lamp, air conditioner, washing machine, fan, rice cooker, and microwave oven.*

## ***Joint Sectoral Committee for Electrical and Electronic Equipment (JSC EEE) Meeting***

*The Joint Sectoral Committee for Electrical and Electronic Equipment (JSC EEE) is a committee that monitors and implements the ASEAN Sectoral Mutual Recognition Agreement (MRA) for Electrical and Electronic Equipment (ASEAN EE MRA) and the ASEAN Harmonised Electrical and Electronic Equipment Regulatory Regime (AHEEERR). The MRA requires members to accept the test results and certifications conducted by laboratories and certification bodies that have been assessed and listed by ASEAN Member*



dijalankan oleh makmal dan badan pensijilan yang telah dinilai dan disenaraikan oleh ASEAN Member State (AMS). Penglibatan ST sebagai AMS Malaysia bertanggungjawab untuk memastikan MRA ini dapat dilaksanakan mengambil kira kepentingan Malaysia.

Pada 2022, sebanyak dua (2) mesyuarat JSC EEE diadakan iaitu secara maya pada 22-23 Mac dan secara fizikal di Pulau Boracay, Filipina pada 18-20 Oktober. Mesyuarat ini dihadiri oleh Sekretariat ASEAN (ASEC), serta delegasi dari negara-negara ASEAN termasuk Malaysia, Brunei Darussalam, Cambodia, Indonesia, Philippines, Singapore dan Vietnam. Antara lain, mesyuarat ini diadakan bagi mengemas kini rejim kawal selia bagi kelengkapan elektrik dan elektronik termasuk penyenaiaan baharu dan pembaharuan makmal-makmal pengujian dan pensijilan.

*States (AMS). The Commission's involvement as Malaysia's AMS is responsible for ensuring the implementation of this MRA, taking into account Malaysia's interests.*

*In 2022, two (2) JSC EEE meetings were held, one virtually on 22-23 March and one physically in Boracay Island, Philippines, on 18-20 October. The meetings were attended by the ASEAN Secretariat (ASEC) and delegations from ASEAN countries, including Malaysia, Brunei Darussalam, Cambodia, Indonesia, the Philippines, Singapore, and Vietnam. Among other things, the meetings were held to update the regulatory regime for electrical and electronic equipment, including new listings and the renewal of testing and certification laboratories.*



Sesi perbincangan di Mesyuarat JSC EEE yang diadakan di Pulau Boracay, Filipina pada 18-20 Oktober 2022  
*A discussion session at the JSC EEE meeting held in Boracay Island, Philippines, on October 18-20, 2022*

## 2. MEMPERKUKUHKAN KEBERTERUSAN BEKALAN TENAGA

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# Perancangan Pembangunan Kapasiti

## Capacity Development Plan

Pada 2022, Kerajaan telah mengekalkan sasaran kapasiti tenaga boleh baharu (TBB) di Malaysia sebanyak 31% menjelang 2025 dan seterusnya menyasarkan 40% menjelang 2040. Secara amnya, penjana tenaga melalui TBB di Semenanjung menunjukkan peningkatan di samping penjana tenaga daripada sumber bahan api arang batu dan gas.

Pada 2022, sebanyak enam (6) projek ladang solar berskala besar (LSS) telah ditambah ke dalam sistem, dengan beberapa lagi dijadualkan beroperasi menjelang akhir 2023.

*In 2022, the Government maintained Malaysia's renewable energy (RE) capacity target at 31% by 2025 and subsequently 40% by 2040. In general, energy generated through RE in the Peninsula as well as energy generated from coal and gas fuel sources, showed an increase.*

*A total of six (6) Large Scale Solar (LSS) projects were added to the system in 2022, with more scheduled to be operational by the end of 2023.*



## Pelan Pembangunan Penjana Semenanjung Malaysia (2022-2041)

Pelan Pembangunan Penjana Semenanjung Malaysia (2022–2041) telah diluluskan oleh Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tariff (JPPPET).

Pelan ini bertujuan memastikan bekalan tenaga yang berdaya harap dan terjamin dapat disediakan kepada pengguna pada harga yang berpatutan, di samping berupaya memenuhi aspirasi Kerajaan serta komitmen antarabangsa.

Pelan ini dibangunkan berdasarkan unjuran permintaan elektrik dan ekonomi negara, di mana kriteria perancangan termasuk mengoptimumkan tahap

## The Peninsular Malaysia Generation Development Plan (2022-2041)

*The Peninsular Malaysia Generation Development Plan (2022-2041) has been approved by the Planning and Implementation Committee for Electricity Supply and Tariff (JPPPET).*

*Its objective is to ensure a reliable and secure energy supply at affordable prices for consumers, in line with the Government's aspirations and global commitment.*

*This plan is developed based on the country's projected electricity demand and economy, where planning criteria include optimising reserve margin levels, reducing the loss of load expectation (LOLE) to ensure generation and transmission are aligned with expected supply capacity,*

margin rizab, mengurangkan *loss of load expectation* (LOLE) bagi memastikan penjanaan dan penghantaran adalah selaras dengan daya harap pembekalan, dan seterusnya mengurangkan skor *Herfindahl-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 di Malaysia kepada sasaran 31% menjelang 2025 dan 40% menjelang 2040, di samping menetapkan kadar kemasukan solar bagi memastikan kestabilan grid. Selain itu, sasaran untuk pengurangan sebanyak 45% intensiti pelepasan gas karbon dioksida per Keluaran Dalam Negara Kasar (KDNK) menjelang 2030 dan seterusnya 60% menjelang 2035 juga termasuk dalam kriteria perancangan. Di samping itu, ketersediaan bahan api, teknologi penjanaan dan kemajuan projek-projek talian penghantaran sedia ada turut dipertimbangkan.

Berdasarkan pertimbangan-pertimbangan tersebut, pelan ini berperanan menentukan campuran kapasiti, campuran bahan api dan margin rizab yang optimum bagi 20 tahun akan datang.

## Campuran Kapasiti Terpasang

Kapasiti terpasang bagi TBB di Semenanjung dijangka akan bertambah daripada 18% pada 2022 kepada 26% menjelang 2025, dan seterusnya 35% menjelang 2041.

Dalam tempoh 20 tahun akan datang, pengurangan ketara dijangka berlaku bagi penjanaan berasaskan bahan api fosil, daripada 82% pada 2022 kepada 62% pada 2041. Pengurangan terbesar adalah bagi arang batu, iaitu daripada 38% pada 2022 kepada 37% pada 2025 dan 7% menjelang 2041. Bagaimanapun, kedudukan gas sebagai bahan api fosil yang paling bersih akan terus mendominasi campuran kapasiti ini. Selain itu, pengenalan teknologi hidrogen bermula 2040 juga merupakan salah satu agenda utama perubahan campuran kapasiti selaras dengan kriteria perancangan untuk skor HHI.

*and further reducing the Herfindahl-Hirschman Index (HHI) score to ensure fuel mix diversity and energy supply continuity. HHI measures the diversity of fuel mix, where a lower value indicates higher fuel diversity and energy supply continuity.*

*The plan also took into account Government policies and aspirations to increase RE generation capacity in Malaysia to 31% by 2025 and, subsequently, 40% by 2040 while establishing solar penetration rates to ensure grid stability. In addition, targets for reducing carbon dioxide emissions intensity by 45% per Gross Domestic Product (GDP) by 2030 and further by 60% by 2035 were included in these planning criteria. Besides that, fuel availability, generation technology and the progress of ongoing transmission line projects were also considered.*

*Based on these considerations, the plan aims to determine the optimal capacity mix, fuel mix and reserve margin for the next 20 years.*

## Installed Capacity Mix

*The Peninsula's RE installed capacity is expected to increase from 18% in 2022 to 26% in 2025 and, subsequently, 35% come 2041.*

*In the succeeding 20 years, a significant reduction is expected in fossil fuel-based power generation, from 82% in 2022 to 62% in 2041. The largest generation reduction will be for coal, from 38% in 2022 to 37% by 2025 and 7% by 2041. However, gas, as the cleanest fossil fuel source, will continue to dominate the capacity mix. The introduction of hydrogen technology starting in 2040 is also a key agenda in transitioning the generation mix in line with the planning criteria for the HHI score.*

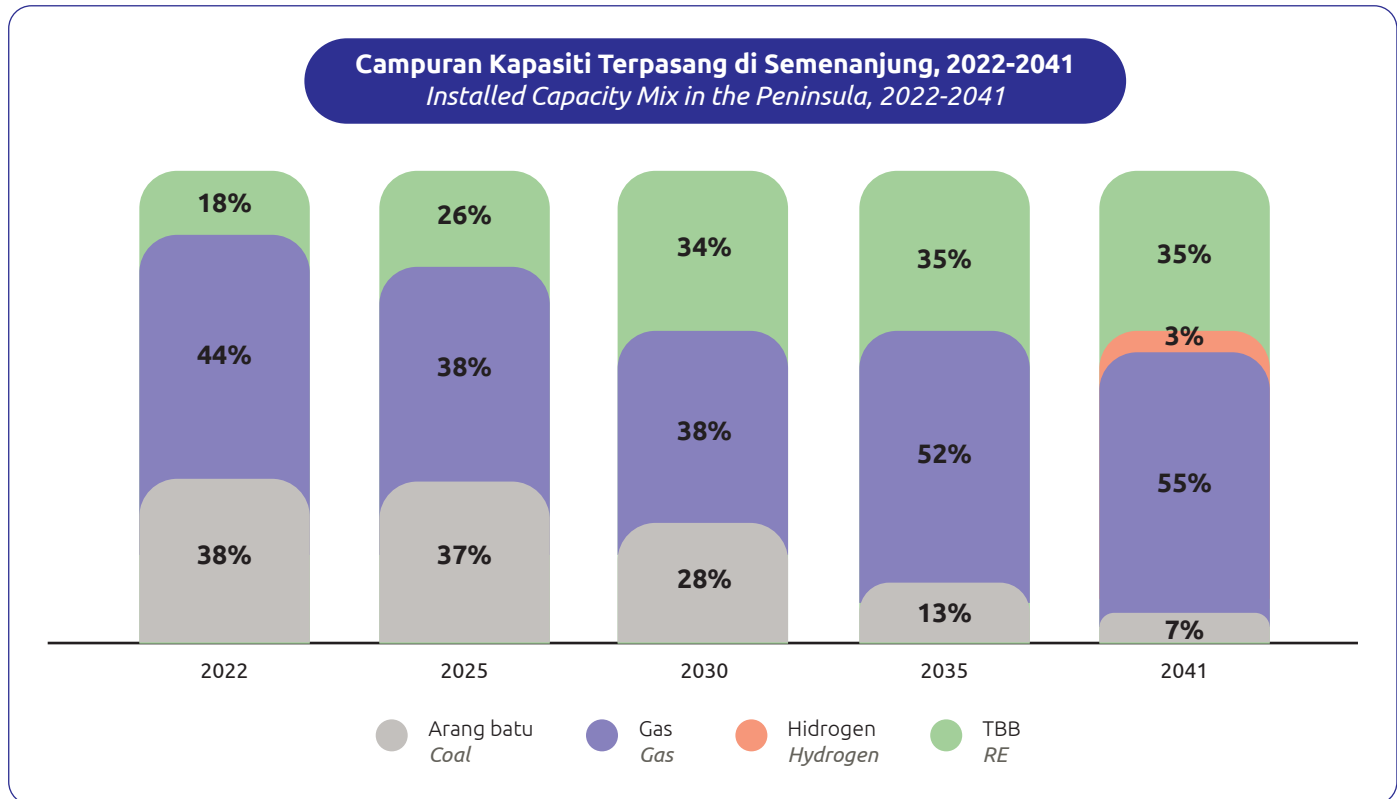


Bagi mencapai sasaran 26% kapasiti terpasang bagi TBB di Semenanjung menjelang 2025, 400 MW kapasiti TBB perlu dibangunkan bermula 2023. Keperluan kapasiti baharu ini merangkumi kapasiti tenaga solar sahaja.

Kestabilan sistem grid dijangka kekal terkawal dengan kemasukan kapasiti solar hibrid yang disertakan dengan *Battery Energy Storage System (BESS)*.

*In order to achieve the 26% RE target in the Peninsula by 2025, a total of 400 MW of RE capacity needs to be developed starting in 2023. This new capacity encompasses solar energy capacity only.*

*Meanwhile, grid system stability is expected to remain stable with hybrid solar capacity coupled with Battery Energy Storage Systems (BESS).*



## Campuran Tenaga

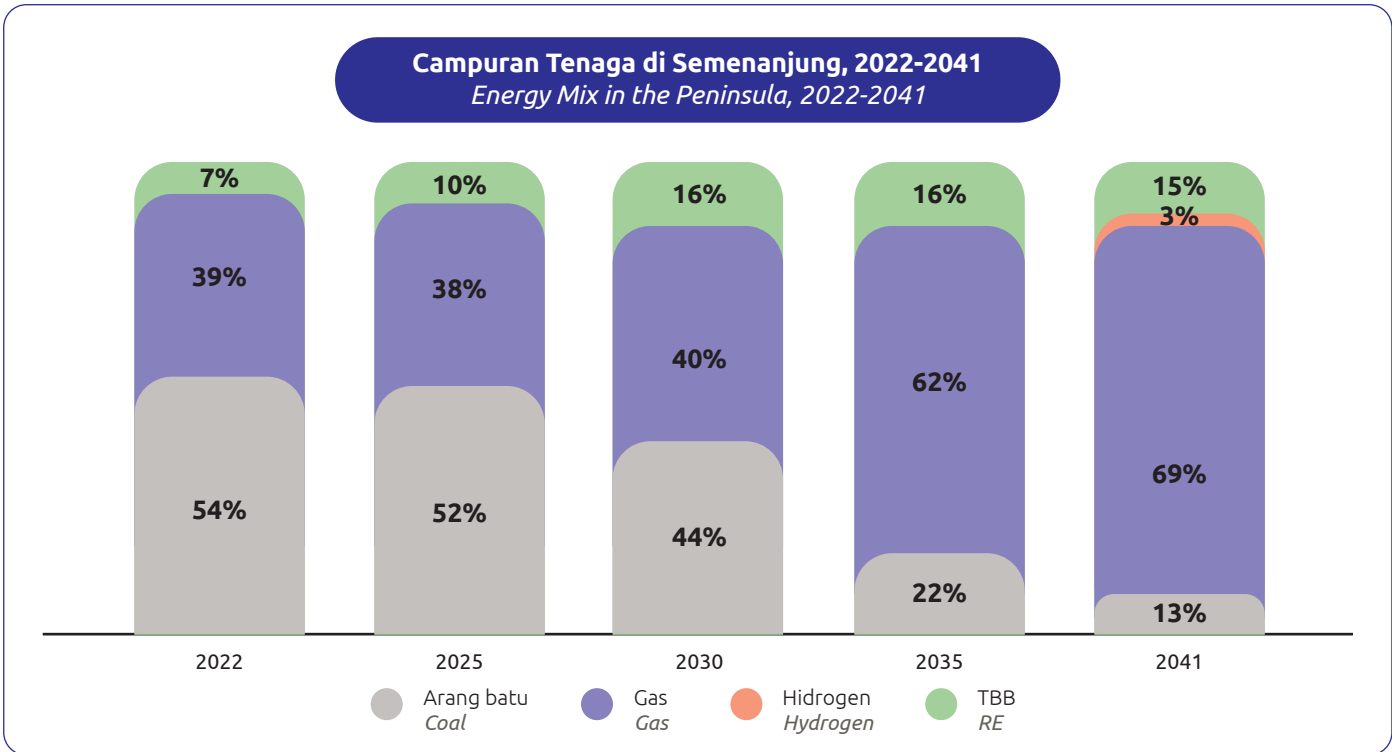
Walaupun secara puratanya gas mendominasi campuran kapasiti bagi tempoh sehingga 2041, dari segi campuran tenaga, arang batu mendahului penjaanaan bahan api yang lain. Ini disebabkan unjuran harganya yang lebih rendah, iaitu pada 44%, berbanding gas pada 40% dan TBB pada 16% menjelang 2030.

Bagaimanapun, campuran arang batu dijangka menunjukkan trend menurun dalam masa 10 tahun akan datang. Pada 2041, bahan api gas akan mendominasi campuran tenaga pada 69%, diikuti dengan arang batu pada 13%, TBB pada 15%, dan hidrogen pada 3%.

## Energy Mix

*Although, on average, gas dominates the capacity mix up to 2041, coal is set to be the major contributor to the energy mix. This is due to its lower forecasted price, accounting for 44% compared to gas at 40% and RE at 16% by 2030.*

*However, coal is expected to display a downward trend over the next ten years. By 2041, gas will contribute 69% of the energy mix, followed by coal with 13%, RE with 15%, and hydrogen with 3%.*



## Margin Rizab

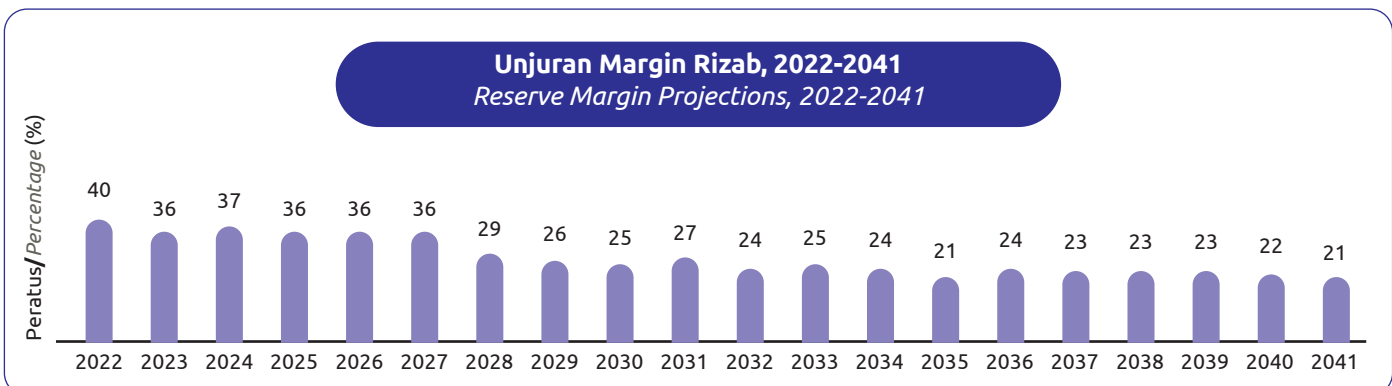
Dengan rekod permintaan maksimum sebanyak 19,183 MW, margin rizab pada 31 Disember 2022 adalah sebanyak 40% berbanding 42% pada 2021. Penurunan ini adalah disebabkan penamatan operasi loji TNB Pasir Gudang (275 MW) dan loji jana kuasa GB3 (640 MW), tamat operasi sambung tara LTM (300 MW) serta kenaikan terhadap permintaan maksimum.

Adalah dijangkakan bahawa kadar margin rizab akan turun kepada 36% pada 2023, dan akan menurun ke lingkungan kadar rizab margin optimum iaitu 20% mulai 2030.

## Reserve Margin

With a record maximum demand of 19,183 MW, the reserve margin as of 31 December 2022 stood at 40% compared to 42% in 2021. The decrease is due to the decommissioning of the TNB Pasir Gudang plant (275 MW) and GB3 power plant (640 MW), the decommissioning of the LTM interconnection (300 MW), along with an increase in maximum demand.

It is expected that the reserve margin rate will decrease to 36% in 2023 and gradually decline to the optimal reserve margin rate of 20% starting 2030.



Nota: Margin rizab bagi 2022 adalah merujuk kepada permintaan puncak 19,183 MW yang direkodkan pada 24 Mei 2022.  
Note: The 2022 reserve margin refers to the peak demand that was recorded on 24 May 2022 at 19,183 MW.

Di Sabah pula, margin rizab mencatatkan sedikit peningkatan ekoran pengoperasian semula Stesen Jana Kuasa Serudong dan Stesen Jana Kuasa Libaran. Margin rizab pada 2022 direkodkan sebanyak 23%, lebih tinggi berbanding 19% pada 2021.

Selain prestasi stesen-stesen jana kuasa sedia ada yang tidak memuaskan, kekangan kapasiti penjanaan daripada projek-projek yang mengalami kelewatan seperti LSS 1 dan LSS 2 juga telah menyebabkan bacaan margin rizab berada di bawah paras optimum 30%.

**Nota:**  
Margin rizab bagi 2022 adalah merujuk kepada permintaan puncak 1,032 MW yang direkodkan pada 11 Ogos 2022.

*In Sabah, the reserve margin saw a slight increase due to the resumption of operations of the Serudong Power Station and Libaran Power Station. The reserve margin in 2022 was recorded at 23%, which is higher than the 2021 figure of 19%.*

*Apart from the underperformance of existing power stations, the capacity constraints resulting from delayed projects such as LSS 1 and LSS 2 have also contributed to the reserve margin readings falling below the optimal level of 30%.*

**Note:**  
*The 2022 reserve margin refers to the peak demand that was recorded on 11 August 2022 at 1,032 MW.*

## Projek Pembangunan Pembekalan Tenaga Berimpak Tinggi

Bagi menjamin keberterusan bekalan tenaga dan memastikan unjuran permintaan pada masa hadapan dapat dipenuhi, ST memantau secara rapi beberapa projek yang diklasifikasikan sebagai berimpak tinggi, khususnya projek penjanaan dan projek penghantaran.

## High-Impact Energy Supply Development Projects

*To ensure energy security and to fulfil forecasted demand, the Commission closely monitors several projects classified as high-impact, particularly generation and transmission projects.*

### Projek Talian Penghantaran di Semenanjung *Transmission Line Projects in the Peninsula*

Projek <i>Project</i>	Lokasi <i>Location</i>
500 kV OHL Ayer Tawar – Bentong South	Perak, Selangor & Pahang
500 kV OHL Bentong South – Lenggeng	Pahang, Selangor & Negeri Sembilan
500 kV OHL Lenggeng – Yong Peng East	Negeri Sembilan & Johor
275 kV OHL Supply to Penang Island	Pulau Pinang

Projek-projek penghantaran yang dikenal pasti sebagai berimpak tinggi seperti yang disenaraikan merupakan sebahagian daripada tulang belakang 500 kV yang sedang dalam pembinaan dari Gurun di utara ke Pasir Gudang di selatan, untuk memudahkan penyaluran tenaga secara pukal terutama ke kawasan beban tinggi seperti di Wilayah Tengah. Sebarang kelewatan terhadap projek-projek talian penghantaran tersebut akan menyebabkan kekangan terhadap evakuasi tenaga daripada Wilayah Utara dan Wilayah Selatan. Selain itu, kelewatan juga boleh menyebabkan risiko beban berlebihan yang tinggi berlaku pada talian penghantaran tersebut.

*The transmission projects identified as high-impact, as listed, are part of the 500 kV backbone that is currently under construction from Gurun in the north to Pasir Gudang in the south. This is to facilitate bulk energy transmission especially to the high load area like the Central Region. Any delays in these transmission line projects could result in constraints on power evacuation from the Northern and Southern regions. Furthermore, delays could also pose a high risk of overload on these transmission lines.*

Projek talian penghantaran 275 kV *Supply to Penang Island* adalah projek bagi menampung bekalan di Pulau Pinang setelah penamatan stesen jana kuasa Gelugor pada 2024. Bagi kawasan pulau, selepas penamatan stesen jana kuasa Gelugor, kebergantungan bekalan tenaga adalah daripada talian penghantaran 275 kV tersebut.

*The 275 kV Supply to Penang Island transmission line project is designed to cater to the power supply needs of Penang Island following the decommissioning of the Gelugor power station in 2024. For the island area, after the Gelugor power station is decommissioned, the power supply dependency will be on the 275 kV transmission line.*

## Pelaksanaan Akses Pihak Ketiga (TPA)

### *Implementation of the Third Party Access (TPA)*

Tahun 2022 merupakan tahun yang mencatat pencapaian signifikan bagi sektor pasaran gas di Semenanjung apabila segmen pasaran pengagihan gas dibuka untuk persaingan pada 1 Januari 2022, setelah persediaan secara progresif selama dua (2) tahun sejak 2020.

Sepanjang tempoh persediaan ini, empat (4) aspek diberi tumpuan iaitu meneutralkan Pelepasan Kos Gas (GCPT), *ring-fencing* terhadap pemain penyandang iaitu Gas Malaysia Berhad kepada syarikat aset dan syarikat penjualan gas, perkembangan ke arah harga asas pasaran gas, dan penerbitan dokumen *Gas Distribution Access Arrangement*.

Pembukaan pasaran ini menyediakan ruang dan peluang kepada pengguna untuk membincangkan keperluan mereka bersama pembekal, untuk berunding syarat-syarat bekalan, dan akhirnya memilih pembekal pilihan mereka.

Hasilnya, tiga (3) *shipper* baharu membekalkan gas kepada pelbagai pengguna dalam segmen pasaran pengagihan pada 2022. Sebagai tambahan kepada Gas Malaysia Energy and Services Sdn. Bhd. sebagai *shipper* penyandang, *shipper* baharu termasuk:

- Petronas Energy and Gas Trading Sdn. Bhd.
- Shell Malaysia Trading Sdn. Bhd.
- Petrolife Aero Sdn. Bhd.

*Shipper* baharu ini membentuk lebih kurang 20% daripada pasaran.

*The year 2022 marked a significant milestone for the gas market sector in the Peninsula as the gas distribution market segment was made contestable on 1 January 2022, following a two-year progressive preparation since 2020.*

*During this preparation period, four (4) main aspects were focused on, namely neutralising Gas Cost Pass-Through (GCPT), ring-fencing of incumbent player which is Gas Malaysia Berhad into asset and gas sales company, progressing into market-based gas price, and the publication of the Gas Distribution Access Arrangement.*

*Contestable market provides avenue and opportunities for consumers to discuss their needs with suppliers, negotiate supply terms, and eventually choose their preferred suppliers.*

*As a result, three (3) new shippers emerged to supply gas to various users in the gas distribution market segment in 2022. In addition to Gas Malaysia Energy and Services Sdn. Bhd. as the incumbent shipper, the new shippers include:*

- *Petronas Energy and Gas Trading Sdn. Bhd.*
- *Shell Malaysia Trading Sdn. Bhd.*
- *Petrolife Aero Sdn. Bhd.*

*These new shippers collectively represent approximately 20% of the market.*

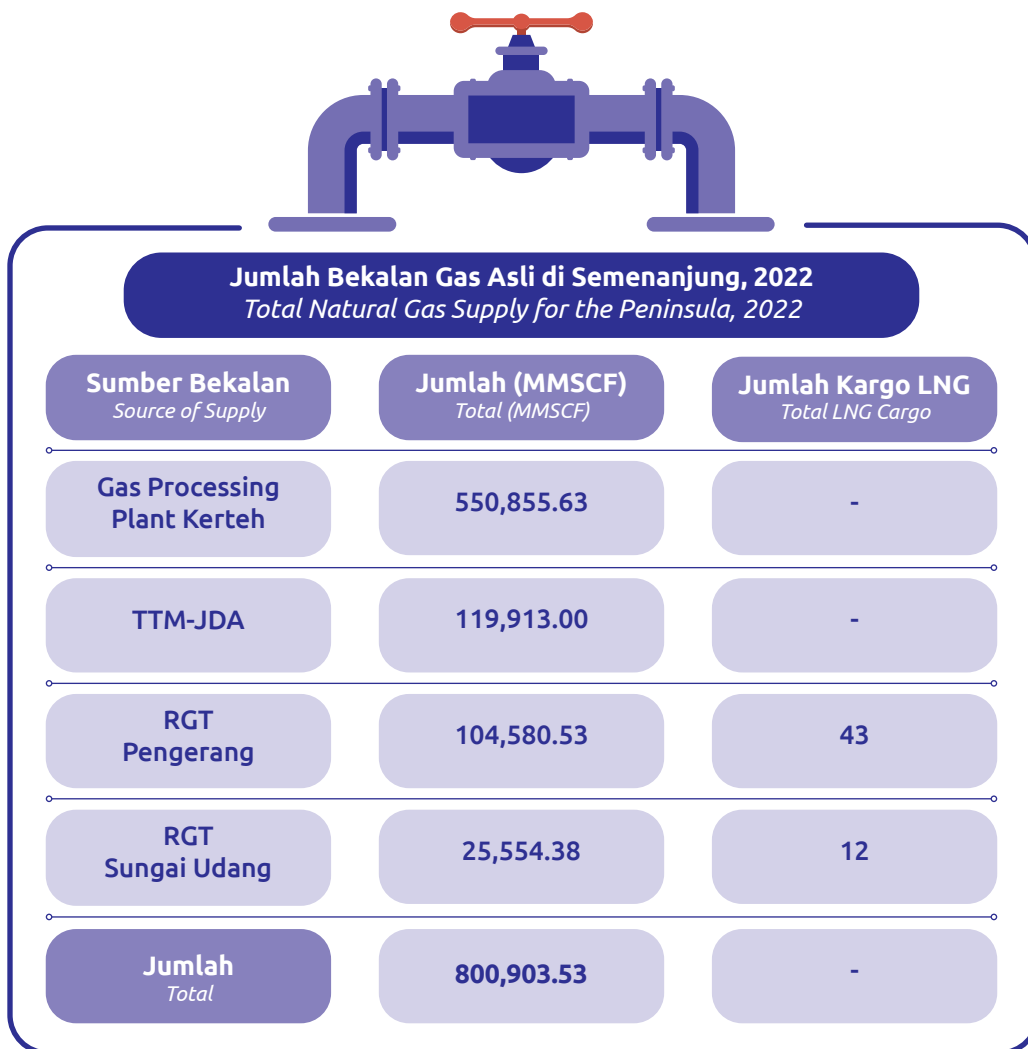


Untuk mengukuhkan lagi rangka kerja TPA, pemilik aset dan kumpulan *shipper* yang aktif telah menubuhkan *Access Arrangement Working Group* (AAWG). Kumpulan kerja ini ditugaskan untuk menyemak keberkesanan pelaksanaan *Access Arrangement* serta mencadangkan sebarang perubahan agar sesuai dengan keperluan pasaran semasa menuju ke arah tempoh matang. AAWG akan menyerahkan cadangan perubahan kepada ST untuk kelulusan sebelum ia dikuatkuasakan.

*To further strengthen the TPA framework, asset owners and group of active shippers have established the Access Arrangement Working Group (AAWG). This working group is tasked with reviewing the effectiveness of the Access Arrangement implementation and proposing any necessary changes to suite the market needs as the market progress towards maturity. The AAWG will submit proposed changes to the Commission for approval before they are enforced.*

Satu lagi pencapaian signifikan untuk 2022 adalah penyiapan *Regional Gas Market Study* yang dimulakan oleh Unit Perancang Ekonomi (EPU) dan diketuai oleh Malaysian Petroleum Resources Corporation (MPRC) yang menjelaskan hala tuju masa depan pasaran gas Malaysia dan meletakkan Malaysia sebagai pusat gas serantau menjelang 2040.

*Another significant achievement for 2022 was the completion of the Regional Gas Market Study initiated by the Economic Planning Unit (EPU) and led by the Malaysian Petroleum Resources Corporation (MPRC). The study defines the pathway towards the future of Malaysian gas market and positions Malaysia as the regional gas centre by 2040.*



# Sorotan Utama

## Main Highlights

### Mesyuarat Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif (JPPPET)

Kabinet telah meluluskan Pelan Pembangunan Penjanaaan Semenanjung Malaysia yang telah diperakui oleh Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif (JPPPET) bagi tahun 2022. Pelan tersebut telah dibangunkan dengan memenuhi kriteria-kriteria perancangan yang ditetapkan serta bertujuan untuk mengimbangi tiga (3) elemen Trilema Tenaga yang merangkumi jaminan, kemampuan dan kelestarian bekalan elektrik. Semakan terhadap Pelan Pembangunan Penjanaaan Semenanjung Malaysia (2021-2040) juga telah dilaksanakan dengan mengambil kira situasi semasa ekonomi negara pasca COVID-19.

Dasar Tenaga Negara (DTN) 2022-2040 yang dilancarkan pada 19 September 2022 adalah disokong oleh tiga (3) objektif iaitu meningkatkan daya tahan ekonomi makro dan jaminan bekalan tenaga, mencapai kesaksamaan sosial menerusi tenaga mampu bayar, serta memastikan kelestarian alam sekitar. Pelan ini memberi penekanan terhadap aspirasi Kerajaan dalam mencapai sasaran negara sifar bersih karbon seawal 2050 termasuk keputusan Kerajaan untuk tidak melaksanakan pembangunan stesen jana kuasa arang batu baharu. Berdasarkan pelan pembangunan yang diluluskan tersebut, kapasiti arang batu pada 2041 di Semenanjung diunjurkan berkurangan kepada 3,000 MW berbanding 12,061 MW pada 2022.

Pelan ini turut menekankan kepentingan kajian lanjut landskap tenaga masa hadapan seperti teknologi BESS, sambung tara dan hidrogen.

### *The Planning and Implementation Committee for Electricity Supply and Tariff (JPPPET)*

*The Cabinet has approved the Peninsular Malaysia Generation Development Plan, which was endorsed by the Electricity Supply and Tariff Planning and Implementation Committee (JPPPET) for 2022. The plan was developed to fulfil the set planning criteria which balance the three (3) elements of the Energy Trilemma, encompassing reliability, affordability, and sustainability of electricity supply. The Peninsular Malaysia Generation Development Plan (2021-2040) has also been reviewed, taking into account the country's current economic situation following the COVID-19 pandemic.*

*The National Energy Policy (NEP) 2022-2040, launched on 19 September 2022, is supported by three objectives: enhancing macroeconomic resilience and energy supply security, achieving social equity through affordable energy, and ensuring environmental sustainability. This plan emphasises the Government's aspirations to achieve the country's net-zero carbon target by 2050, including the decision to not build new coal-fired power plant. Based on the approved development plan, coal capacity in the Peninsula is projected to decrease to 3,000 MW by 2041, compared to 12,061 MW in 2022.*

*The plan also emphasises the importance of conducting further studies on the future energy landscape, including technologies such as BESS, interconnections, and hydrogen.*

## **Pelaksanaan Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP)**

Lao PDR, Thailand, Malaysia, dan Singapura melalui satu kenyataan bersama pada 23 September 2014 di Vientiane telah bersama-sama bersetuju untuk menubuhkan *Lao PDR, Thailand, Malaysia, Singapore-Power Integration Project (LTMS-PIP) Working Group* untuk mengkaji kebolehlaksanaan secara teknikal konsep perdagangan kuasa rentas sempadan dari Lao PDR ke Singapura.

Pada 23 Jun 2022, LTMS-PIP telah memulakan penghantaran tenaga dari Lao PDR ke Singapura, dengan kapasiti perdagangan kuasa sehingga 100 MW selama dua (2) tahun. Tenaga ini disalurkan dari Lao PDR melalui sambungan talian penghantaran sedia ada Thailand dan Malaysia dan sehingga ke Singapura.

## ***The Implementation of the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP)***

*Lao PDR, Thailand, Malaysia, and Singapore, through a joint statement on 23 September 2014, in Vientiane, agreed to establish the Lao PDR, Thailand, Malaysia, Singapore-Power Integration Project (LTMS-PIP) Working Group to assess the technical feasibility of a cross-border power trading concept from Lao PDR to Singapore.*

*On 23 June 2022, the LTMS-PIP initiated the power transmission from Lao PDR to Singapore, with a power trading capacity of up to 100 MW for a period of two (2) years. This power is transmitted from Lao PDR through the existing transmission line connections in Thailand and Malaysia, reaching all the way to Singapore.*

# 3. MEMASTIKAN DAYA HARAP PEMBEKALAN TENAGA DAN KUALITI PERKHIDMATAN INDUSTRI

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# Prestasi Permintaan dan Pembekalan Elektrik

## Electricity Demand and Supply Performance

### Permintaan Elektrik

Prestasi dan pencapaian bagi daya harap pembekalan tenaga dan kualiti perkhidmatan industri bagi Semenanjung, Sabah dan Labuan terus diteliti menerusi beberapa siri Mesyuarat Jawatankuasa yang dijalankan sepanjang 2022.

### Electricity Demand

The performance and achievements in the reliability of power supply and service quality of the industry for the Peninsula, Sabah and Labuan were continuously studied through several series of Committee Meetings conducted throughout 2022.

### Mesyuarat Jawatankuasa Kod Grid, 2022

#### Grid Code Committee Meeting, 2022

Mesyuarat Meeting	Tarikh Date	Perbincangan Discussion	Penglibatan Participants
Mesyuarat Jawatankuasa Kod Grid Semenanjung Malaysia <i>Peninsular Malaysia Grid Code Committee Meeting</i>	15 Mac 2022 15 March 2022	Mendapatkan keputusan dan pelan hala tuju bagi perkara-perkara berkaitan keboleharapan dan keberterusan sistem grid.	Dipengerusikan oleh ST, Jawatankuasa Mesyuarat terdiri daripada pihak <i>Grid System Operator (GSO), Single Buyer (SB), Tenaga Nasional Berhad (TNB) Penjanaan, Penjana Bebas dan wakil-wakil industri bekalan elektrik.</i>
	20 Julai 2022 20 July 2022	<i>Obtaining decisions and directional plans for matters related to the reliability and security of the grid system.</i>	<i>Chaired by the Commission, the Committee Meeting comprises representatives from Grid System Operator (GSO), Single Buyer (SB), Tenaga Nasional Berhad (TNB) Generation, Independent Power Producers, and representatives from the electricity supply industry.</i>
	8 Disember 2022 8 December 2022		
Mesyuarat Jawatankuasa Kod Grid Sabah dan Wilayah Persekutuan Labuan <i>Sabah and Federal Territory of Labuan Grid Code Committee Meeting</i>	28 Mac 2022 28 March 2022	Mendapatkan keputusan dan pelan hala tuju bagi perkara-perkara berkaitan keboleharapan dan keberterusan sistem grid.	Dipengerusikan oleh ST, keanggotaan Mesyuarat terdiri daripada pihak GSO, SB, PETRONAS, Penjana Bebas dan wakil-wakil industri bekalan elektrik.
	2 Ogos 2022 2 August 2022	<i>Obtaining decisions and directional plans for matters related to the reliability and security of the grid system.</i>	<i>Chaired by the Commission, the Committee Meeting includes participation from GSO, SB, PETRONAS, Independent Power Producers, and representatives from the electricity supply industry.</i>
	13 Disember 2022 13 December 2022		

### Semenanjung

Secara keseluruhannya, permintaan puncak sistem grid di Semenanjung menunjukkan peningkatan setelah tamatnya Perintah Kawalan Pergerakan (PKP) 3.0 pada 11 Jun 2021. Pada 2022, permintaan puncak sistem grid di Semenanjung mencatat rekod tertinggi sebanyak 19,183 MW pada 24 Mei 2022, peningkatan sebanyak 3.2% berbanding 18,585 MW pada 2021. Bagaimanapun, bacaan permintaan puncak bulanan menunjukkan penurunan dari bulan Jun sehingga Disember 2022 berikutan faktor cuaca.

### The Peninsula

Overall, the peak demand for the grid system in the Peninsula showed an increase after the end of the Movement Control Order (MCO) 3.0 on 11 June 2021. In 2022, the peak demand for the grid system in the Peninsula recorded a record high of 19,183 MW on 24 May 2022, an increase of 3.2% compared to 18,585 MW in 2021. However, the monthly peak demand readings showed a decrease from June to December 2022 due to weather factors.

**Permintaan Puncak di Semenanjung, 2020-2022**  
*Peak Demand in the Peninsula, 2020-2022*

2020

**18,808 MW**

10 Mac 2020 / 10 March 2020

2021

**18,585 MW**

13 Oktober 2021 / 13 October 2021

2022

**19,183 MW**

24 Mei 2022 / 24 May 2022

Jumlah penjanaan elektrik di Semenanjung pada 2022 mencatatkan peningkatan sebanyak 4.08% kepada 130,625 GWj, berbanding 125,503 GWj pada 2021. Peningkatan jumlah tenaga ini disebabkan impak penamatan PKP yang membolehkan pengoperasian semula bagi kebanyakan sektor industri dan juga komersial.

*The total electricity generation in the Peninsula recorded an increase of 4.08% in 2022 to 130,625 GWh in comparison to 125,503 GWh in 2021. The increase is due to the lifting of the MCO, which allowed most industrial and commercial sectors to resume operations.*

**Sabah**

Di Sabah pula, permintaan puncak dicatatkan pada 1,032.1 MW bagi 2022, iaitu peningkatan sebanyak 2.9% berbanding 2021. Jumlah pembekalan tahunan yang direkodkan bagi 2022 adalah sebanyak 6,911.9 GWj, peningkatan sebanyak 3.9% berbanding 2021, kesan kerancangan aktiviti ekonomi dan sosial hasil penamatan PKP.

**Sabah**

*In Sabah, the peak demand recorded in 2022 was 1,032.1 MW, an increase of 2.9% compared to 2021. The annual supply recorded for 2022 was 6,911.9 GWh, representing a 3.9% increase compared to 2021. These increases resulted from the accelerated economic and social activities following the end of MCO.*

**Permintaan Puncak di Sabah, 2020-2022**  
*Peak Demand in Sabah, 2020-2022*

2020

**987.0 MW**

20 Ogos 2020 / 20 August 2020

2021

**1,002.8 MW**

28 Mei 2021 / 28 May 2021

2022

**1,032.1 MW**

11 Ogos 2022 / 11 August 2022

**Kapasiti Penjanaan**

**Semenanjung**

Jumlah kapasiti terpasang daripada penjanaan stesen jana kuasa di Semenanjung pada 2022 adalah sebanyak 27,620 MW dengan campuran kapasiti yang terdiri daripada arang batu (43.9%), gas (43.2%), hidro (8.1%), solar (3.8%), dan lain-lain (1.0%).

**Generation Capacity**

**The Peninsula**

*The total installed capacity from the power stations generation in the Peninsula in 2022 amounted to 27,620 MW with a capacity mix consisting of coal (43.9%), gas (43.2%), hydro (8.1%), solar (3.8%) and others (1.0%).*

Secara umumnya, jumlah tenaga elektrik yang dijana dibekalkan kepada pengguna industri (38.2%), pengguna komersial (33.4%) dan pengguna domestik (26.4%), di mana 2.0% yang selebihnya dibekalkan kepada aktiviti perlombongan, pertanian dan lampu awam.

*In general, the total electricity generated was supplied to industrial (38.2%), commercial (33.4%) and domestic (26.4%) consumers, while the remaining 2.0% was supplied to mining and agricultural activities as well as public lighting.*

### Kapasiti Terpasang di Semenanjung, 2021 & 2022 *Installed Capacity in the Peninsula, 2021 & 2022*

	2021	2022
<b>Kapasiti Terpasang</b> <i>Installed Capacity</i>	Arang Batu (12,054 MW) <i>Coal (12,054 MW)</i>	Arang Batu (12,054 MW) <i>Coal (12,054 MW)</i>
	Gas (11,395 MW) <i>Gas (11,395 MW)</i>	Gas (11,974 MW) <i>Gas (11,974 MW)</i>
	Hidro (2,237 MW) <i>Hydro (2,237 MW)</i>	Hidro (2,237 MW) <i>Hydro (2,237 MW)</i>
		LSS (1,060 MW) <i>LSS (1,060 MW)</i>
	Mini Hidro (295 MW) <i>Mini Hydro (295 MW)</i>	Mini Hidro (295 MW) <i>Mini Hydro (295 MW)</i>
	Sambungtara (300 MW) <i>Interconnection (300 MW)</i>	-
	<b>JUMLAH 26,890 MW</b> <i>Total 26,890 MW</i>	<b>JUMLAH 27,620 MW</b> <i>Total 27,620 MW</i>
<b>Margin Rizab</b> <i>Reserve Margin</i>	42%	39%*
<b>Permintaan Maksimum</b> <i>Peak Demand</i>	18,585 MW	19,183 MW
<b>Penjanaan Tenaga</b> <i>Energy Generation</i>	391.282 GWj /GWh	398.523 GWj /GWh
<b>Tarikh</b> <i>Date</i>	13 Oktober 2021 <i>13 October 2021</i>	24 Mei 2022 <i>24 May 2022</i>
<b>Jumlah Tenaga</b> <i>Total Energy</i>	125,503 GWj /GWh	130,625 GWj /GWh

Nota: Jumlah kapasiti terpasang adalah tidak termasuk *self-generation* dan kojana.  
*Note: The installed capacity mentioned does not include self-generation and cogeneration.*

\*Data ini merangkumi bahagian sistem grid Semenanjung sahaja  
*This data covers the Peninsula grid system only*

Kapasiti terpasang di Semenanjung berkurangan pada 2022 dengan penamatan kapasiti bekalan sambungtara Lao PDR-Thailand-Malaysia (LTM) pada Disember 2021.

*The installed capacity in the Peninsula decreased in 2022 due to the termination of the supply capacity of the Lao PDR-Thailand-Malaysia (LTM) interconnection grid in December 2021.*

Penamatan operasi loji jana kuasa TNB Pasir Gudang (275 MW) pada Ogos 2022 dan GB3 (640 MW) pada Disember 2022 juga menyumbang terhadap pengurangan kapasiti terpasang tersebut.

*The decommissionings of the TNB Pasir Gudang power plant (275 MW) in August 2022 and the GB3 power plant (640 MW) in December 2022 also contributed to the reduction in installed capacity.*

Bagaimanapun, sistem grid kembali menerima penambahan kapasiti dengan permulaan operasi Ladang Solar Berskala Besar (LSS) Viva Solar Sdn. Bhd. (30 MW) pada Januari 2022, Solarpack Suria Sungai Petani Sdn. Bhd. (90.88 MW), BGMC BRAS Power Sdn. Bhd. (30 MW) dan LSS3 Pekan Sdn. Bhd. (100 MW) masing-masing pada Mac 2022, Kerian Solar Sdn. Bhd. (100 MW) pada Ogos 2022 dan Coara Marang Sdn. Bhd. (100 MW) pada September 2022. Selain itu, penambahan kapasiti 2022 juga sedikit sebanyak didorong oleh faktor permulaan operasi dua (2) blok loji jana kuasa Edra Energy Sdn. Bhd. (1,494 MW) pada Februari 2022.

However, the grid system received additional capacity with the commencement of the Large Scale Solar (LSS) farms, namely Viva Solar Sdn. Bhd. (30 MW) on January 2022; Solarpack Suria Sungai Petani Sdn. Bhd. (90.88 MW), BGMC BRAS Power Sdn. Bhd. (30 MW), and LSS3 Pekan Sdn. Bhd. (100 MW) on March 2022; Kerian Solar Sdn. Bhd. (100 MW) on August 2022; and Coara Marang Sdn. Bhd. (100 MW) on September 2022. Furthermore, the additional capacity in 2022 was also driven by the commencement of two (2) blocks of power plants by Edra Energy Sdn. Bhd. (1,494 MW) on February 2022.

## Sabah

Kapasiti boleh harap di Sabah pada 2022 adalah sebanyak 1,268.1 MW, meningkat berbanding 1,176.34 MW pada 2021. Peningkatan ini disebabkan oleh pengoperasian semula beberapa loji jana kuasa seperti Stesen Jana Kuasa Serudong, Stesen Jana Kuasa Libaran dan TSH Biomass.

## Sabah

The dependable capacity in Sabah in 2022 was 1,268.1 MW, an increase compared to 1,176.34 MW in 2021. This increase was due to the re-commissioning of several power plants, such as the Serudong Power Station, Libaran Power Station and TSH Biomass Power Plant.

### Kapasiti Boleh Harap di Sabah, 2021-2022 Dependable Capacity in Sabah, 2021 & 2022

Year	Gas / Gas (932.80 MW)	Diesel / Diesel (138.98 MW)	Hidro / Hydro (86.36 MW)	TBB / RE (18.20 MW)	JUMLAH / Total 1,176.34 MW
2021	Gas / Gas (932.80 MW)	Diesel / Diesel (138.98 MW)	Hidro / Hydro (86.36 MW)	TBB / RE (18.20 MW)	JUMLAH / Total 1,176.34 MW
2022	Gas / Gas (961.38 MW)	Diesel / Diesel (193.98 MW)	Hidro / Hydro (86.36 MW)	TBB / RE (26.37 MW)	JUMLAH / Total 1,268.10 MW

Nota: Jumlah kapasiti boleh harap adalah tidak termasuk LSS berkapasiti 50 MW.  
Note: The dependable capacity mentioned does not include LSS projects with 50 MW capacity.

### Kapasiti Terpasang di Sabah, 2021-2022 Installed Capacity in Sabah, 2021 & 2022

Year	Gas / Gas (1,124 MW)	Diesel / Diesel (174 MW)	Hidro / Hydro (98 MW)	TBB / RE (21 MW)	LSS / LSS (50 MW)	JUMLAH / Total 1,467 MW
2021	Gas / Gas (1,124 MW)	Diesel / Diesel (174 MW)	Hidro / Hydro (98 MW)	TBB / RE (21 MW)	LSS / LSS (50 MW)	JUMLAH / Total 1,467 MW
2022	Gas / Gas (1,124.64 MW)	Diesel / Diesel (243.2 MW)	Hidro / Hydro (98.4 MW)	TBB / RE (35.3 MW)	LSS / LSS (50 MW)	JUMLAH / Total 1,551.4 MW

Nota: Jumlah kapasiti terpasang adalah tidak termasuk self-generation dan kojana.  
Note: The installed capacity mentioned does not include self-generation and cogeneration.

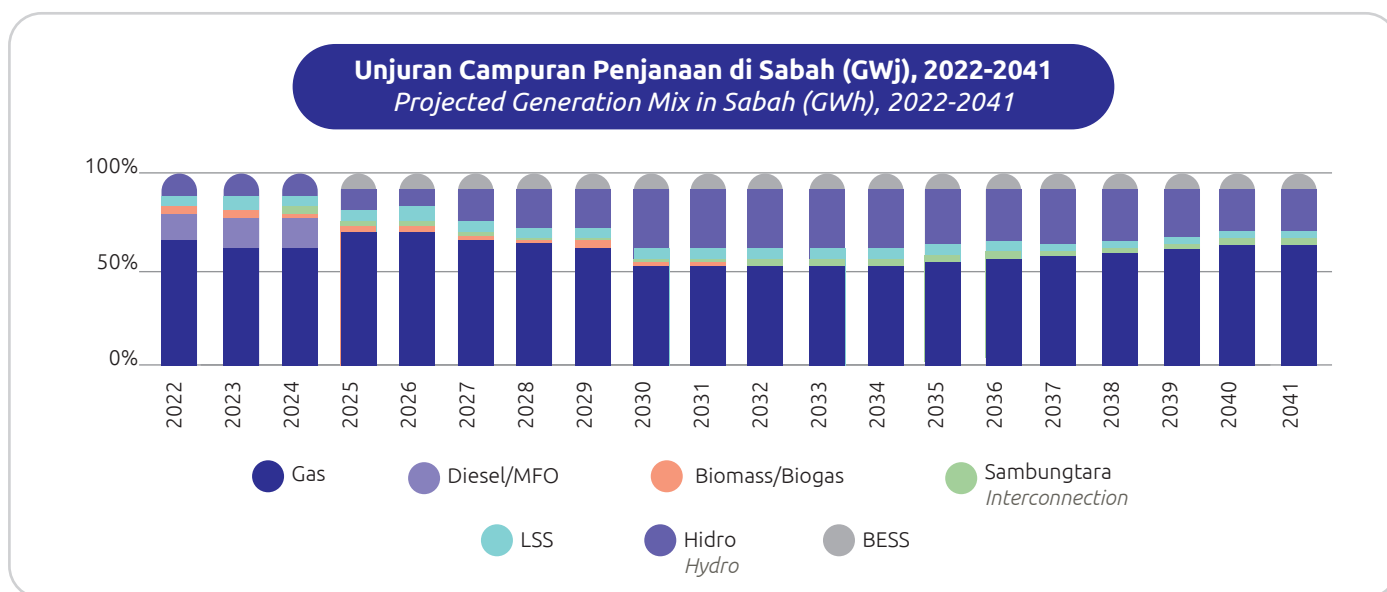


Pada 2025, sejumlah 194 MW penjaanan diesel di Sabah akan menamatkan operasinya. Oleh itu, Mesyuarat Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif (JPPPET) Sabah Bil. 1/2022 mengambil kira keperluan kapasiti baharu thermal pada 2024 atau 2025 bagi menampung kapasiti yang berkurangan selepas penamatan tersebut. Selain itu, beberapa projek LSS dan Projek Loji Jana Kuasa Hibrid Bateri Dan Solar (LSS-BESS) di Pantai Timur Sabah juga turut dirancang untuk pengoperasian 2025.

Pada 2022, purata penjaanan tenaga mengikut pecahan bahan api adalah sebanyak 86% gas diikuti diesel 7%, hidro 5% dan TBB 2%. Bagaimanapun, dalam tempoh 20 tahun akan datang, terdapat penurunan penjaanan daripada gas dan peningkatan penjaanan daripada sumber TBB seperti LSS-BESS dan hidro.

*A total of 194 MW of diesel generation in Sabah will cease operations in 2025. Therefore, the Sabah Planning and Implementation of Electricity Supply and Tariff Committee (JPPPET) Meeting No. 1/2022 takes into account the need for new thermal capacity in 2024 or 2025 to accommodate the reduced capacity after the termination. Additionally, several LSS and Battery Energy Storage System Hybrid Power Plant (LSS-BESS) projects on the East Coast of Sabah are also planned for operation in 2025.*

*In 2022, the average fuel breakdown for energy generation was 86% gas, 7% diesel, 5% hydro, and RE 2%. However, over the next 20 years, there will be a decrease in gas generation and an increase in generation from RE sources such as LSS-BESS and hydro.*



### Campuran Penjaanan

Bagi menjamin daya harap dan keberterusan bekalan tenaga, beberapa siri Mesyuarat Jawatankuasa telah dijalankan pada 2022, bertujuan menyediakan platform perbincangan yang berkesan untuk menangani isu-isu berhubung kecukupan bekalan bahan api bersama pemegang taruh industri.

### Generation Mix

*To ensure the reliability and security of energy supply, several series of Committee Meetings were conducted in 2022 to provide an effective platform for discussions to address issues related to fuel supply adequacy in collaboration with industry stakeholders.*

**Mesyuarat Jawatankuasa Pembekalan Gas dan Arang Batu, 2022**  
*Gas and Coal Supply Committee Meeting, 2022*

<b>Mesyuarat Meeting</b>	<b>Tarikh Date</b>	<b>Perbincangan Discussion</b>	<b>Penglibatan Participants</b>
<b>Mesyuarat Jawatankuasa Pembekalan Gas bagi Semenanjung Malaysia</b> <i>Peninsular Malaysia Gas Supply Committee Meeting</i>	14 Februari 2022 <i>14 February 2022</i>  7 Jun 2022 <i>7 June 2022</i>	Prestasi pembekalan gas, kadar penggunaan gas oleh sektor tenaga, operasi sistem grid serta perancangan pembekalan dan penggunaan gas bagi 2022 dan juga isu-isu lain <i>Gas supply performance, energy sector usage rate, grid system operations, gas supply and usage plan for 2022, and other related issues</i>	Wakil-wakil dari Unit Perancang Ekonomi (EPU), PETRONAS Energy & Gas Trading Sdn. Bhd. (PEGT), PETRONAS Gas Bhd. (PGB), GSO, SB dan Gas Malaysia Berhad (GMB) <i>Representatives from the Economic Planning Unit (EPU), PETRONAS Energy &amp; Gas Trading Sdn. Bhd. (PEGT), PETRONAS Gas Bhd. (PGB), GSO, SB and Gas Malaysia Berhad (GMB)</i>
<b>Mesyuarat Jawatankuasa Pembekalan Gas bagi Sabah dan Wilayah Persekutuan Labuan</b> <i>Sabah and Federal Territory of Labuan Gas Supply Committee Meeting</i>	28 Januari 2022 <i>28 January 2022</i>  6 Julai 2022 <i>6 July 2022</i>	Prestasi pembekalan gas, kadar penggunaan gas oleh sektor tenaga, operasi sistem grid serta perancangan pembekalan dan penggunaan gas bagi 2022 <i>Gas supply performance, energy sector usage rate, grid system operations, gas supply and usage plan for 2022</i>	Wakil-wakil dari Kementerian, PETRONAS, GSO dan SB <i>Representatives from the Ministry, PETRONAS, GSO, and SB</i>
<b>Mesyuarat Jawatankuasa Pembekalan Arang Batu</b> <i>Coal Supply Committee Meeting</i>	19 Januari 2022 <i>19 January 2022</i>  30 Ogos 2022 <i>30 August 2022</i>	Situasi pembekalan arang batu dan isu-isu berkaitan serta prestasi sistem grid <i>Coal supply situation, related issues and grid system performance</i>	Wakil-wakil daripada EPU, Kementerian, GSO, SB, TNB Fuel Services Sdn. Bhd. (TNBF), TNB Power Generation Sdn. Bhd. (Genco) dan stesen-stesen jana kuasa arang batu <i>Representatives from the EPU, Ministry, GSO, SB, TNB Fuel Services Sdn. Bhd. (TNBF), TNB Power Generation Sdn. Bhd. (Genco), and coal-fired power plants</i>

Berikutan sekatan eksport arang batu oleh Kerajaan Indonesia pada awal 2022 dan harga arang batu yang melonjak di pasaran, terdapat pengurangan dalam penggunaan arang batu bagi penjanaan elektrik pada 2022 berbanding 2021.

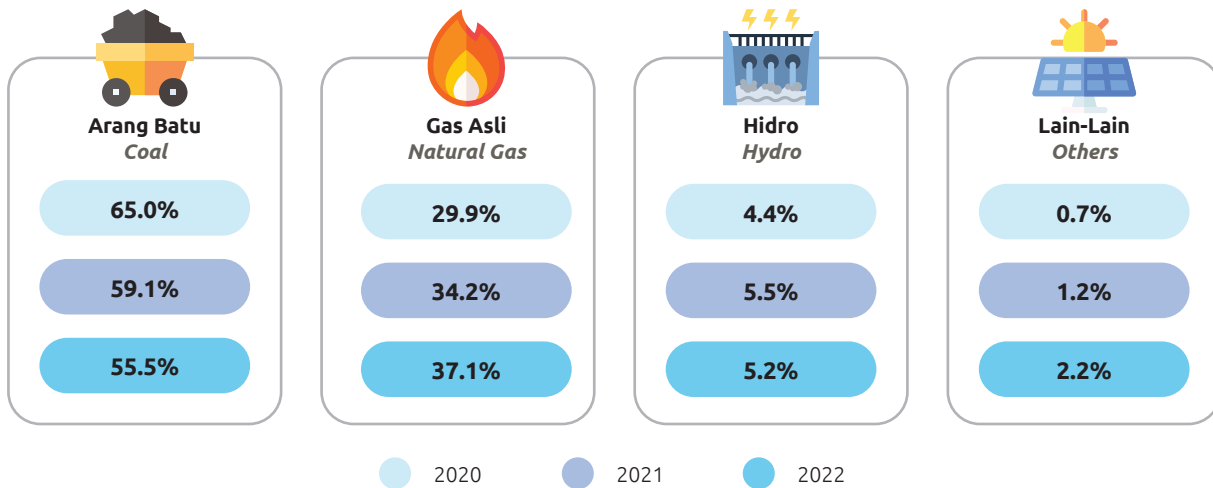
Selain itu, terdapat juga peningkatan penggunaan gas asli dalam penjanaan elektrik berikutan bermulanya *Commercial Operation Date* (COD) bagi dua (2) unit stesen jana kuasa gas yang baharu iaitu EMPP Block 1 (747.3 MW) dan EMPP Block 2 (747.3 MW) yang mula beroperasi secara komersial masing-masing pada 25 Februari 2022 dan 1 Mac 2022. Stesen jana kuasa gas yang tamat operasi pula adalah PGPS (275 MW) dan SGB3 (640 MW), masing-masing pada 31 Ogos 2022 dan 30 Disember 2022.

*Following the export restrictions on coal imposed by the Indonesian Government in early 2022 and the subsequent surge in coal prices in the market, there has been a reduction in the use of coal for electricity generation in 2022 compared to 2021.*

*Furthermore, there has been an increase in the use of natural gas for electricity generation due to the Commercial Operation Date (COD) of two (2) new gas power plants, namely EMPP Block 1 (747.3 MW) and EMPP Block 2 (747.3 MW), which commenced commercial operations on 25 February 2022 and 1 March 2022, respectively. Meanwhile, PGPS (275 MW) and SGB3 (640 MW) power plants ceased operations on 31 August 2022 and 30 December 2022, respectively.*

### Campuran Penjaan di Semenanjung, 2020-2022

Generation Mix in the Peninsula, 2020-2022

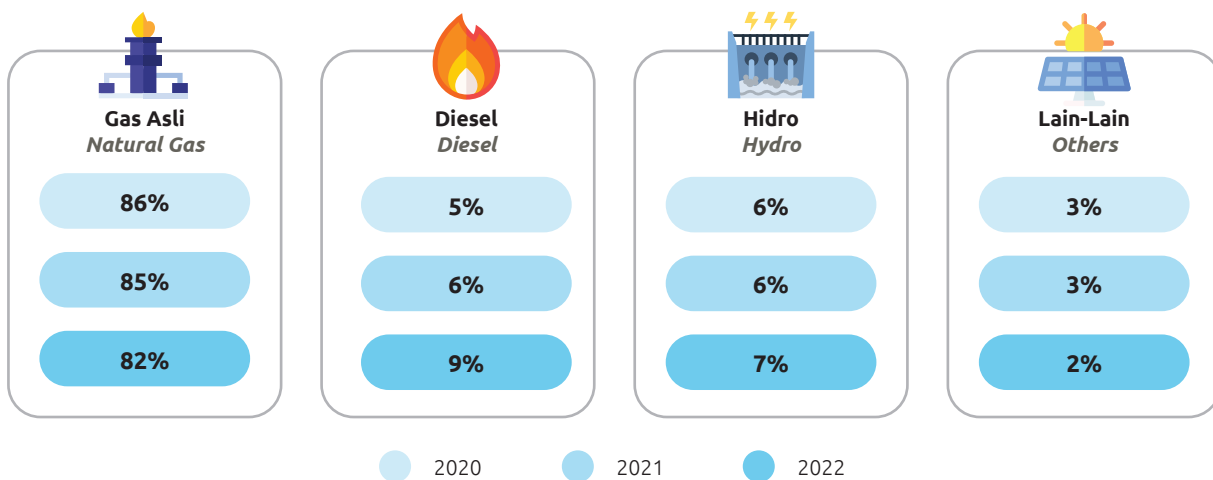


Bagi Sabah dan Labuan pula, trend campuran penjaan tidak banyak berubah berbanding tahun sebelumnya. Penjaan berasaskan gas asli berada di tahap 82% manakala penjaan melalui diesel, hidro dan lain-lain masing-masing mencatatkan peratusan 9%, 7% dan 2%.

For Sabah and Labuan, the generation mix remained relatively unchanged compared to previous years. Natural gas-based generation accounts for 82%, while diesel, hydro, and other sources contribute 9%, 7%, and 2%, respectively.

### Campuran Penjaan di Sabah dan Labuan, 2020-2022

Generation Mix in Sabah and Labuan, 2020-2022



#### Arang Batu

Sebanyak 31.07 juta metrik tan arang batu telah diimport ke stesen-stesen jana kuasa arang batu di Semenanjung. Daripada jumlah tersebut, 66% adalah arang batu subbitumen manakala 34% adalah arang batu bitumen.

#### Coal

A total of 31.07 million metric tons of coal were imported to coal-fired power plants in the Peninsula, of which 66% consisted of sub-bituminous coal, while 34% consisted of bituminous coal.

### Sumber Arang Batu yang Diimport, 2022 Sources of Imported Coal, 2022



### Gas Asli

Jumlah penggunaan gas asli bagi tujuan penjanaan elektrik mencatatkan purata 890 mmscfd bagi Semenanjung, lebih tinggi berbanding 801 mmscfd tahun sebelumnya. Ini berikutan faktor harga pasaran arang batu yang tinggi. Bagi Sabah dan Labuan pula, penggunaan gas asli untuk penjanaan elektrik mencatatkan purata 130 mmscfd, tidak jauh berbeza dengan kadar penggunaan pada tahun-tahun sebelumnya.

### Natural Gas

The natural gas utilisation for electricity generation in the Peninsula recorded an average of 890 mmscfd, higher than the preceding year's average of 801 mmscfd. This increase is due to the high market prices of coal. For Sabah and Labuan, the average natural gas utilisation for electricity generation was 130 mmscfd, which is relatively consistent with previous years' usage rates.

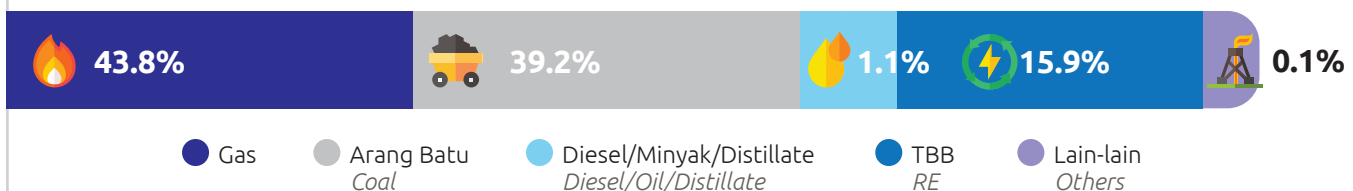
### Tenaga Boleh Baharu (TBB)

Pada 2021, Semenanjung dan Sabah mencatatkan peratusan TBB sebanyak 15.9% iaitu 4,940.07 MW daripada kapasiti terpasang keseluruhan (termasuk self-generation dan kojana) sebanyak 31,074.53 MW. Ia merupakan peningkatan sebanyak 18% daripada tahun sebelumnya iaitu 4,584.12 MW.

### Renewable Energy (RE)

In 2021, the Peninsula and Sabah recorded a renewable energy (RE) percentage of 15.9%, which is 4,940.07 MW out of the total installed capacity (including self-generation and cogeneration) of 31,074.53 MW. This represents an increase of 18% compared to the previous year, which was 4,584.12 MW.

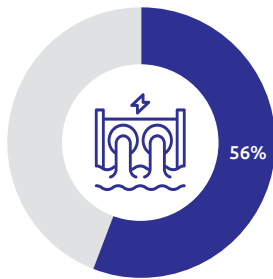
### Kapasiti Terpasang Semenanjung dan Sabah, 2021 Installed Capacity of the Peninsula and Sabah, 2021



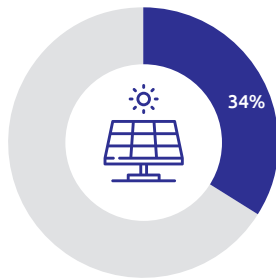


### Kapasiti Terpasang Keseluruhan TBB, 2021

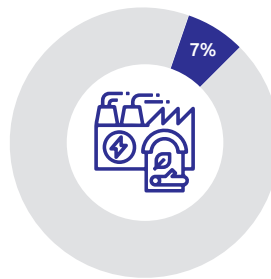
Total Installed Capacity of RE, 2021



**Hidro**  
Hydro



**Solar**  
Solar



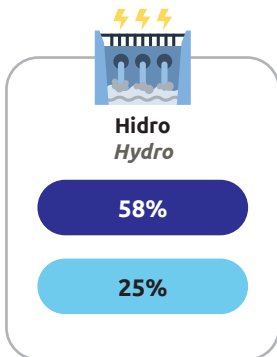
**Biojisim**  
Biomass



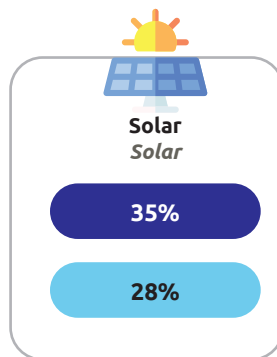
**Biogas**  
Biogas

### Kapasiti Terpasang TBB di Semenanjung dan Sabah, 2021

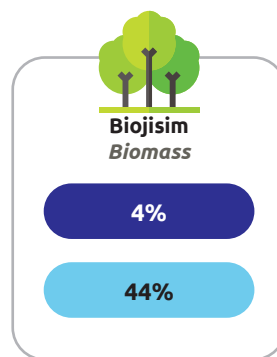
Installed Capacity of RE in the Peninsula and Sabah, 2021



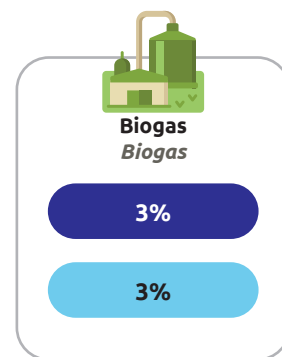
**Hidro**  
Hydro



**Solar**  
Solar



**Biojisim**  
Biomass



**Biogas**  
Biogas

**JUMLAH KAPASITI TBB**  
Total RE Capacity : **4,535.27 MW**

**JUMLAH KAPASITI TBB**  
Total RE Capacity : **404.80 MW**

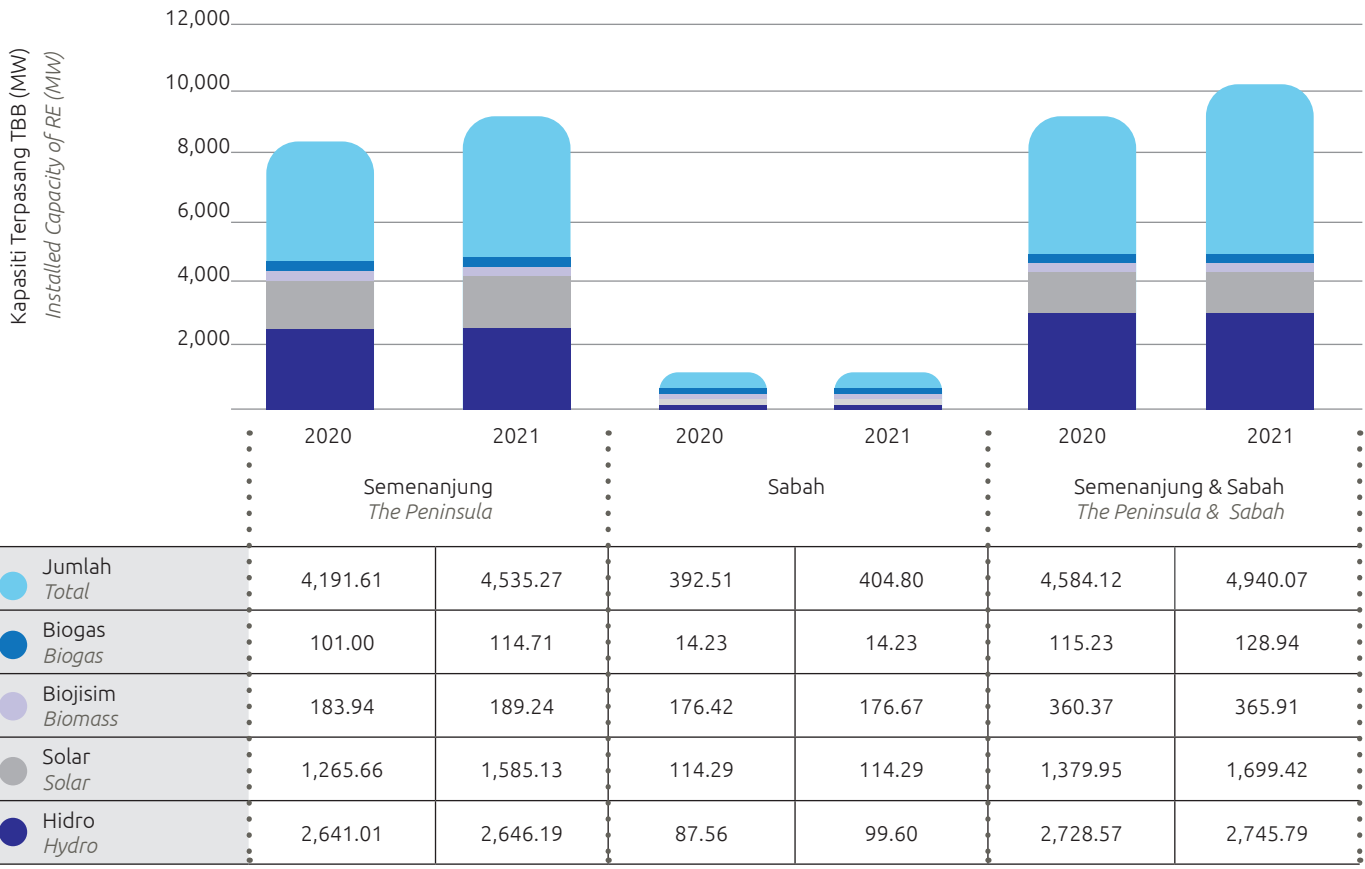
● Semenanjung  
The Peninsula

● Sabah

Terdapat peningkatan kapasiti terpasang TBB di Semenanjung dan Sabah pada 2021 berbanding 2020 iaitu sebanyak 8% (2021: 4,535.27 MW, 2020: 4,191.61 MW) di Semenanjung manakala 39% (2021: 404.80 MW, 2020: 392.51 MW) di Sabah. Peningkatan juga dapat dilihat daripada semua jenis sumber tenaga TBB.

There was an increase in the installed capacity of renewable energy (RE) in both the Peninsula and Sabah in 2021 compared to 2020. In the Peninsula, there was an 8% increase (2021: 4,535.27 MW, 2020: 4,191.61 MW), while in Sabah, there was a 39% increase (2021: 404.80 MW, 2020: 392.51 MW). The increase can be observed across all types of RE sources.

**Kapasiti Terpasang TBB di Semenanjung dan Sabah, 2020-2021**  
*Installed Capacity of RE in the Peninsula and Sabah, 2020-2021*



**Demand Forecasting Committee (DFC) 2022**

Demand Forecasting Committee (DFC) merupakan platform bagi mendapatkan input dan nasihat daripada pihak-pihak berkepentingan dan berkepakaran berhubung unjuran pertumbuhan ekonomi, teknologi dan polisi terkini serta permintaan elektrik. Mesyuarat DFC dipengerusikan oleh ST dan disertai oleh wakil-wakil Jabatan Perdana Menteri, Kementerian Kewangan, Kementerian Perdagangan Antarabangsa dan Industri, Kementerian Tenaga dan Sumber Asli (KeTSA), Sustainable Energy Development Authority (SEDA), Unit Perancangan Ekonomi Negara Sabah, TNB, Sabah Electricity Sdn. Bhd. (SESB), Sarawak Energy Berhad, SB Semenanjung & Sabah, GSO Semenanjung, Persekutuan Pekilang-Pekilang Malaysia dan Gabungan Persatuan-Persatuan Pengguna Malaysia. Hasil unjuran permintaan elektrik yang diluluskan oleh DFC akan diguna pakai dalam Pelan Pembangunan Penjana di Semenanjung

**Demand Forecasting Committee (DFC) 2022**

The Demand Forecasting Committee (DFC) serves as a platform to gather input and advice from stakeholders and experts on economic growth projections, the latest technology and policy developments, as well as electricity demand. The DFC meetings are chaired by the Commission and attended by representatives from the Prime Minister's Department, Ministry of Finance, Ministry of International Trade and Industry, Ministry of Energy and Natural Resources, Sustainable Energy Development Authority (SEDA), Sabah's State Economic Planning Unit, TNB, Sabah Electricity Sdn. Bhd. (SESB), Sarawak Energy Berhad, the Peninsula's & Sabah's SB, the Peninsula's GSO, Federation of Malaysian Manufacturers, and the Federation of Malaysian Consumer Associations. The electricity demand projections approved by the DFC are used in the Peninsula's and Sabah's Generation Development Plan for approval by JPPPET at the Ministry level.

dan Sabah untuk kelulusan JPPPET di peringkat Kementerian.

Mesyuarat DFC Bil. 1/2022 pada 4 Ogos 2022 membincangkan andaian yang diguna pakai sebagai input bagi membangunkan unjuran permintaan elektrik untuk 2022 sehingga 2041. Selain itu, penambahbaikan kepada kaedah unjuran permintaan puncak juga dibincang dan dilaksanakan.

Empat (4) andaian utama yang mencorakkan perubahan unjuran yang ketara dalam kajian unjuran permintaan elektrik tahun ini meliputi:

- Pertumbuhan Keluaran Dalam Negara Kasar (KDNK) yang diramalkan menaik selaras dengan prestasi ekonomi negara yang kian meningkat.
- Peningkatan terhadap jumlah penjimatan hasil daripada aktiviti cekap tenaga yang sentiasa melebihi sasaran, ditambah dengan ketiadaan kelengkapan satu (1) bintang di pasaran, serta pengenalan terhadap teknologi kojana.
- Pertambahan bilangan kenderaan elektrik (EV) selaras dengan polisi galakan terkini oleh Kerajaan.
- Peningkatan terhadap *system losses* berpandukan data sejarah.

Perubahan unjuran-unjuran ini memberi impak kepada permintaan elektrik dan dijangkakan unjuran permintaan puncak akan bertambah jika dibandingkan dengan unjuran DFC 2021. Pertumbuhan permintaan puncak diunjurkan pada kadar 1.90% bagi Semenanjung dan 2.27% bagi Sabah untuk tempoh 19 tahun ke hadapan.

Mesyuarat DFC turut membincangkan tentang kajian *system losses* bagi Sabah. Kaedah pengiraan *system losses* telah ditambah baik dengan menggunakan kaedah yang lebih tepat dan menggambarkan komponen sebenar yang menyumbang kepada *system losses* tersebut. Dalam hal ini, SESB telah membentangkan aktiviti dan strategi bagi mengurangkan *system losses* di Sabah.

Hasil Kajian Unjuran Permintaan Elektrik bagi Semenanjung dan Sabah (2022-2041) yang diluluskan dapat membantu dalam merancang pembekalan dan permintaan elektrik dengan lebih tepat dan digunakan dalam analisis kajian untuk Mesyuarat JPPPET seterusnya.

*The DFC Meeting No. 1/2022 on 4 August 2022 discussed the assumptions used as inputs to develop electricity demand projections for the period of 2022 to 2041. Additionally, improvements to the peak demand projections methodology were also discussed and implemented.*

*The four (4) key assumptions that shaped significant changes in this year's electricity demand projections study include:*

- *The projected growth of Gross Domestic Product (GDP) is expected to increase in line with the improving economic performance of the country.*
- *Increase in energy savings resulting from efficient energy practices that consistently exceed targets, coupled with the absence of one-star rating appliances in the market and the introduction of cogeneration technology.*
- *Increase in the number of electric vehicles (EVs) in line with the government's current encouragement policy.*
- *An increase in system losses based on historical data.*

*Changes in these projections have an impact on electricity demand, and it is expected that the peak demand projections will increase compared to the DFC 2021 projections. The peak demand growth is projected to be at a rate of 1.90% for the Peninsula and 2.27% for Sabah over the next 19 years.*

*The DFC meeting also discussed the study on system losses in Sabah. The methodology for calculating system losses has been improved by using a more accurate approach that reflects the actual components contributing to these losses. In this regard, SESB presented activities and strategies to reduce system losses in Sabah.*

*The approved results of the Electricity Demand Projection Study for the Peninsula and Sabah (2022 - 2041) would help in planning a more accurate electricity supply and demand plan to support the analysis of future JPPPET Meetings.*

# Pembekalan Gas Melalui Talian Paip

## Gas Supply Via Pipelines

### Pembekalan Gas Asli Mengikut Sektor

Pada 2022, jumlah pembekalan gas asli di Semenanjung Malaysia oleh Petronas Energy and Gas Trading Sdn. Bhd. (PEGT) adalah sebanyak 621,911,178.42 MMBtu, Gas Malaysia Energy and Services Sdn. Bhd. (GMES) sebanyak 156,188,568.50 MMBtu, Shell Malaysia Trading Sdn. Bhd. (SHELL) sebanyak 4,436,091.00 MMBtu dan Petrolife Aero Sdn. Bhd. (PASB) adalah sebanyak 1,707,820.00 MMBtu.

Bagi pembekalan gas asli oleh PEGT, 99.77% daripada jumlah pembekalan adalah daripada sektor industri dan 0.23% daripada sektor komersial.

Bagi pembekalan gas asli oleh GMES pula, 99.50% daripada jumlah pembekalan adalah sektor industri, 0.49% daripada sektor komersial dan 0.02% daripada sektor domestik.

Pembekalan gas asli di Sabah dan Labuan oleh Sabah Energy Corporation Sdn. Bhd. (SEC) pula adalah sebanyak 700,388.74 MMBtu. Sebahagian besar pembekalan gas asli adalah oleh sektor industri dengan jumlah pembekalan 655,660.24 MMBtu dan selebihnya dibekalkan kepada sektor komersial iaitu sebanyak 44,728.50 MMBtu.

### Natural Gas Supply by Sector

In 2022, the natural gas supply in the Peninsula by Petronas Energy and Gas Trading Sdn. Bhd. (PEGT) amounted to 621,911,178.42 MMBtu, Gas Malaysia Energy and Services Sdn. Bhd. (GMES) supplied 156,188,568.50 MMBtu, Shell Malaysia Trading Sdn. Bhd. (SHELL) provided 4,436,091.00 MMBtu, and Petrolife Aero Sdn. Bhd. (PASB) contributed 1,707,820.00 MMBtu.

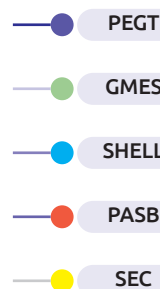
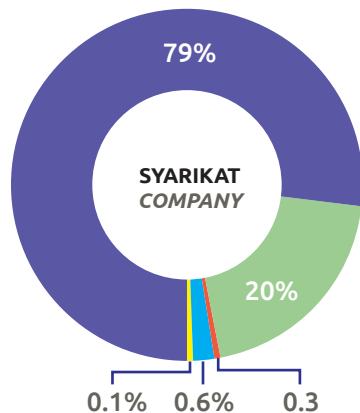
For the natural gas supply by PEGT, 99.77% of the total supply was from the industrial sector and 0.23% from the commercial sector.

As for the natural gas supply by GMES, 99.50% of the total supply was from the industrial sector, 0.49% from the commercial sector, and 0.02% from the domestic sector.

The natural gas supply in Sabah and Labuan by Sabah Energy Corporation Sdn. Bhd. (SEC) was 700,388.74 MMBtu. The majority of the natural gas supply was for the industrial sector, with a total supply of 655,660.24 MMBtu, while the remaining supply was provided to the commercial sector, which amounted to 44,728.50 MMBtu.

### Pembekalan Gas Asli di Semenanjung, Sabah dan Labuan, 2022

#### Natural Gas Supply in the Peninsula, Sabah and Labuan, 2022



#### Pembekalan Mengikut Sektor (MMBtu) Supply by Sector (MMBtu)

	Industri Industrial	Komersial Commercial	Domestik Domestic	Jumlah Total
PEGT	620,470,928.67	1,440,249.75	-	621,911,178.42
GMES	155,402,960.02	761,983.98	23,624.49	156,188,568.50
SHELL	4,436,091.00	-	-	4,436,091.00
PASB	1,707,820.00	-	-	1,707,820.00
SEC	655,660.24	44,728.50	-	700,388.74



## Pembekalan Gas Asli Mengikut Sub-Industri

Pembekalan bukan tenaga oleh PEGT adalah dalam sub-industri getah, pembuatan makanan, minuman dan tembakau, kimia, kaca dan lain-lain sub-industri di mana pembekalan masing-masing adalah 5,753,638.18 MMBtu, 3,909,752.05 MMBtu, 108,110,686.31 MMBtu, 11,089,885.21 MMBtu dan 54,517,872.35 MMBtu. Ini menjadikan jumlah pembekalan gas asli bagi bukan tenaga oleh PEGT adalah sebanyak 183,381,834.10 MMBtu. Pembekalan bagi sektor tenaga pula adalah 374,126,777.06 MMBtu, manakala bagi eksport adalah 64,402,567.26 MMBtu.

GMES secara keseluruhannya membekalkan sebanyak 155,402,960.02 MMBtu bagi sektor bukan tenaga, dengan pembekalan di bawah sub-industri getah adalah paling tinggi iaitu sebanyak 42,241,486.74 MMBtu.

Pembekalan gas asli di Sabah serta Labuan oleh Sabah Energy Corporation Sdn. Bhd. (SEC) tertumpu kepada kategori bukan tenaga iaitu logam asas dengan jumlah 140,519.19 MMBtu, getah sebanyak 76,649.64 MMBtu, pembuatan makanan, minuman dan tembakau sebanyak 99,396.42 MMBtu, kimia sebanyak 330,765.64 MMBtu dan bagi pembekalan yang lain sebanyak 53,057.84 MMBtu.

## Natural Gas Supply by Sub-Industry

The non-energy supply by PEGT is distributed across sub-industries such as rubber, food, drinks and tobacco manufacturing, chemical, glass, and other sub-industries, with respective supplies of 5,753,638.18 MMBtu, 3,909,752.05 MMBtu, 108,110,686.31 MMBtu, 11,089,885.21 MMBtu, and 54,517,872.35 MMBtu. This amounts to a total non-energy natural gas supply by PEGT of 183,381,834.10 MMBtu. The supply for the energy sector is 374,126,777.06 MMBtu, while the export supply is 64,402,567.26 MMBtu.

Overall, GMES supplied a total of 155,402,960.02 MMBtu for the non-energy sector, with the highest supply in the rubber sub-industry, amounting to 42,241,486.74 MMBtu.

The natural gas supply in Sabah and Labuan by Sabah Energy Corporation Sdn. Bhd. (SEC) mainly focused on non-energy categories, such as base metals with a total supply of 140,519.19 MMBtu, rubber with 76,649.64 MMBtu, food, drinks, and tobacco manufacturing with 99,396.42 MMBtu, chemical industry with 330,765.64 MMBtu, and other supplies with 53,057.84 MMBtu.

### Pembekalan Gas Asli Mengikut Sub-Industri bagi Bukan Tenaga, Tenaga dan Eksport di Semenanjung, Sabah dan Labuan, 2022 Natural Gas Supply by Sub-Industry for Non-Energy, Energy, and Export in the Peninsula, Sabah and Labuan, 2022

Bukan Tenaga Non Energy	Pembekalan Gas Asli Mengikut Kategori Sub-Industri (MMBtu) Natural Gas Supply by Sub-Industry Categories (MMBtu)				
	PEGT	GMES	SHELL	PASB	SEC
● Galian Bukan Logam Non-Metallic Minerals	0.00	10,453,772.30	0.00	0.00	0.00
● Logam Asas Base Metal	0.00	8,892,373.89	0.00	0.00	140,519.19
● Getah Rubber	5,753,638.18	42,241,486.74	1,287,321.00	0.00	76,649.64
● Makanan, Minuman & Tembakau Food, Drinks & Tobacco	3,909,752.05	39,097,997.27	0.00	0.00	99,396.42
● Kimia Chemical	108,110,686.31	15,604,891.66	3,148,770.00	938,740.00	330,765.64

● Elektrik & Elektronik <i>Electric &amp; Electronic</i>	0.00	1,616,399.07	0.00	0.00	0.00
● Mesin & Peralatan <i>Machine &amp; Equipment</i>	0.00	211,320.68	0.00	0.00	0.00
● Fabrikasi Logam <i>Metal Fabrication</i>	0.00	3,340,001.52	0.00	0.00	0.00
● Kaca <i>Glass</i>	11,089,885.21	9,850,137.43	0.00	769,080.00	0.00
● Lain-lain <i>Other</i>	54,517,872.35	24,094,579.46	0.00	0.00	53,057.84
<b>Tenaga <i>Energy</i></b>	<b>374,126,777.06</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Eksport <i>Export</i></b>	<b>64,402,567.26</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### Pengguna Gas Asli Mengikut Sektor

Bagi PEGT, sejumlah 46 pengguna gas asli adalah dari sektor industri dan satu (1) pengguna daripada sektor komersial.

Bagi GMES pula, sebahagian besar pengguna mereka iaitu 9,502 adalah daripada sektor domestik. Sektor industri dan sektor komersial GMES pula masing-masing mencatatkan bilangan pengguna sebanyak 1,021 dan 770. Secara keseluruhan, pengguna gas asli GMES adalah 11,293 pengguna.

Selain itu, pengguna SHELL dan PASB adalah bagi sektor industri sahaja, masing-masing sebanyak lima (5) dan dua (2).

Di Sabah dan Labuan, pengguna gas asli SEC berjumlah 30 pengguna sahaja, di mana 28 daripadanya adalah pengguna daripada sektor industri dan dua (2) daripada sektor komersial.

### Natural Gas Consumer by Sector

For PEGT, a total of 46 natural gas consumers are from the industrial sector, and one (1) consumer is from the commercial sector.

For GMES, the majority of their consumers, which is 9,502, are from the domestic sector. The industrial sector and commercial sector of GMES have 1,021 and 770 consumers, respectively. Overall, GMES has 11,293 natural gas consumers.

Meanwhile, SHELL and PASB have consumers only from the industrial sector, with five (5) and two (2) consumers, respectively.

In Sabah and Labuan, SEC has a total of 30 natural gas consumers, where 28 of them are from the industrial sector, and two (2) are from the commercial sector.

### Pengguna Gas Asli Mengikut Sektor di Semenanjung, Sabah dan Labuan, 2022

*Natural Gas Consumers by Sector in the Peninsula, Sabah and Labuan, 2022*

Syarikat <i>Company</i>	Pengguna Mengikut Sektor <i>Consumer by Sector</i>			Jumlah <i>Total</i>
	Industri <i>Industrial</i>	Komersial <i>Commercial</i>	Domestik <i>Domestic</i>	
PEGT	46	1	-	47
GMES	1,021	770	9,502	11,293
SHELL	5	0	0	5
PASB	2	0	0	2
SEC	28	2	0	30

## Talian Paip Gas Asli

Di Semenanjung, Sabah dan Labuan, panjang talian paip jenis *polyethylene* berjumlah 598.7 km manakala paip jenis *steel* berjumlah 4,355.54 km. Di Semenanjung, kebanyakan paip adalah daripada jenis *steel* dan talian paip tersebut adalah milik PETRONAS Gas Berhad (PGB) (2,218.15 km), Trans Thai-Malaysia (Malaysia) Sdn. Bhd. (TTMM) (8.2 km) dan juga Gas Malaysia Distribution Sdn. Bhd. (GMD) (2,111.33 km). Selain itu, hanya 586.54 km talian paip jenis *polyethylene* terdapat di Semenanjung, yang merupakan milik GMD.

Talian paip pengagihan di Sabah dan Labuan adalah milik SEC dan PGB. Panjang talian paip jenis *steel* bagi PGB adalah sepanjang 13.86 km dan 4.00 km adalah milik SEC. Selain itu, hanya 12.16 km talian paip jenis *polyethylene* yang terdapat di Sabah dan Labuan, yang merupakan milik SEC.

## Natural Gas Pipelines

In the Peninsula, Sabah, and Labuan, the total length of *polyethylene* pipelines is 598.7 km, whereas *steel* pipelines amounted to 4,355.54 km. In the Peninsula, the majority of pipelines are made of *steel*, and these pipelines are owned by PETRONAS Gas Berhad (PGB) (2,218.15 km), Trans Thai-Malaysia (Malaysia) Sdn. Bhd. (TTMM) (8.2 km), and Gas Malaysia Distribution Sdn. Bhd. (GMD) (2,111.33 km). Additionally, there is only 586.54 km of *polyethylene* pipelines in the Peninsula, which are owned by GMD.

The distribution pipelines in Sabah and Labuan are owned by SEC and PGB. The length of *steel* pipelines for PGB is 13.86 km, and 4.00 km is owned by SEC. Furthermore, there is only 12.16 km of *polyethylene* pipelines in Sabah and Labuan, which are owned by SEC.

### Talian Paip Gas Asli di Semenanjung, Sabah dan Labuan, 2022 Natural Gas Pipelines in the Peninsula, Sabah and Labuan, 2022

Syarikat Company	Talian Paip (km) Pipeline(km)			
	Semenanjung (km) The Peninsula (km)		Sabah dan Labuan (km) Sabah and Labuan (km)	
	<i>Polyethylene</i>	<i>Steel</i>	<i>Polyethylene</i>	<i>Steel</i>
PGB	-	2,218.15	-	13.86
TTMM	-	8.20	-	-
GMD	586.54	2,111.33	-	-
SEC	-	-	12.16	4.00
Jumlah Total	<b>586.54</b>	<b>4,337.68</b>	<b>12.16</b>	<b>17.86</b>

## Prestasi Sistem Penghantaran

### Transmission System Performance

#### Semenanjung

Prestasi sistem penghantaran TNB di Semenanjung dalam tempoh lima (5) tahun ke belakang menunjukkan peningkatan apabila bacaan *Delivery Point Unreliability Index* (DePUI) atau sistem minit pada 2022 meningkat 100% kepada 0.172 daripada 0.086 minit pada 2021.

#### The Peninsula

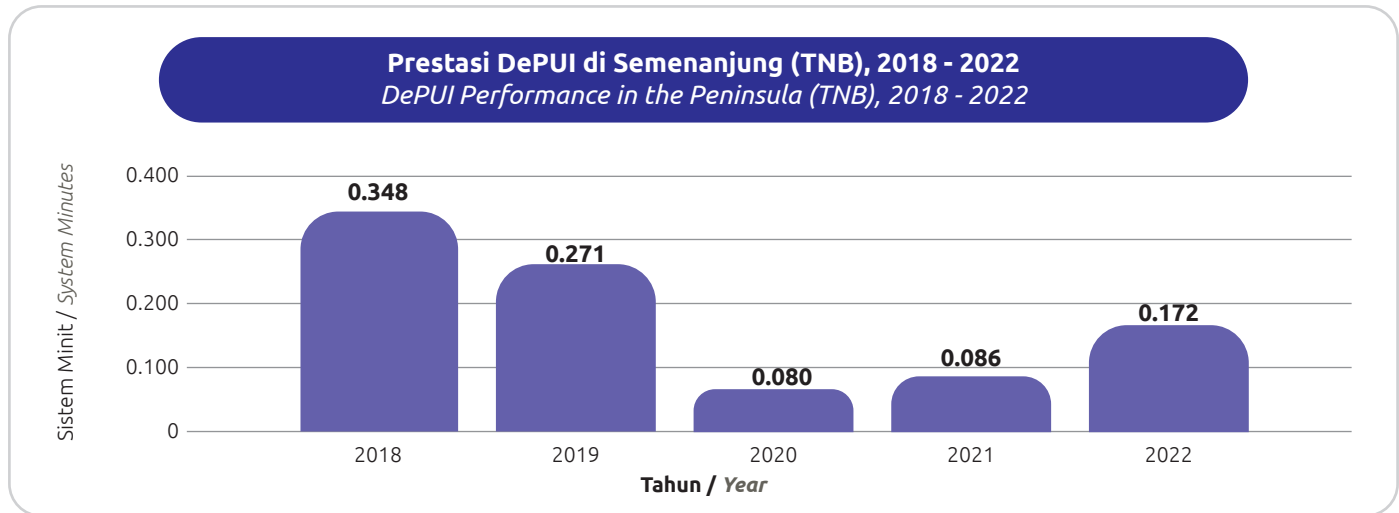
The TNB transmission system performance in the Peninsula over the past five (5) years has shown improvement as the *Delivery Point Unreliability Index* (DePUI) or system minutes reading increased by 100% to 0.172 from 0.086 minutes in 2021. A downward trend in DePUI was also observed,

Trend penurunan DePUI juga dicatat sebanyak 50% daripada 0.348 minit pada 2018 kepada 0.172 minit pada 2022.

Secara keseluruhannya, prestasi DePUI bagi grid nasional 2022 masih berada di tahap yang baik dan tidak melebihi sasaran yang ditetapkan oleh ST iaitu dua (2) minit.

with a 50% decrease from 0.348 minutes in 2018 to 0.172 minutes in 2022.

Overall, the DePUI performance for the national grid in 2022 remained satisfactory and did not exceed the target set by the Commission, which is two (2) minutes.



Terdapat satu (1) kejadian insiden lucutan beban dicatatkan di Semenanjung pada 27 Julai 2022. Laporan dan butiran insiden ini telah dimuat naik di laman sesawang ST untuk makluman umum. Kejadian ini telah dipulihkan oleh pihak GSO dalam tempoh dua (2) jam 23 minit. Berdasarkan kepada peraturan di bawah *Guaranteed Service Level 2 (GSL2), Performance Standard of Electricity Supply Services of TNB* yang dibangunkan oleh ST, tempoh masa pemulihan bekalan elektrik yang ditetapkan mestilah tidak melebihi lapan (8) jam bagi *major incident on grid or transmission system* yang mengakibatkan *partial blackout*.

One (1) load shedding incident was recorded in the Peninsula on 27 July 2022. The incident report and details have been uploaded on the Commission's website for public information. The incident was restored by the GSO in two (2) hours and 23 minutes. According to the regulations under the *Guaranteed Service Level 2 (GSL2), Performance Standard of Electricity Supply Services of TNB* developed by the Commission, the prescribed duration for the restoration of electricity supply should not exceed eight (8) hours for a major incident on the grid or transmission system resulting in a partial blackout.

## Sabah dan Labuan

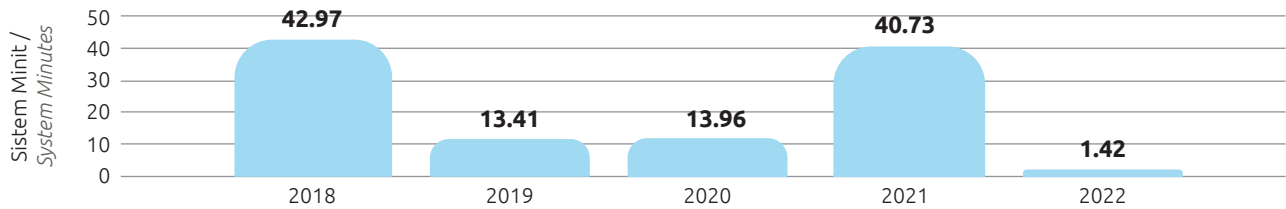
Dalam tempoh lima (5) tahun terakhir, prestasi sistem penghantaran pada 2022 menunjukkan prestasi baik dengan penurunan DePUI daripada 42.97 minit pada 2018 kepada 1.42 minit pada 2022. Faktor penurunan ini berikutan hanya lima (5) insiden lucutan beban grid 132 kV yang berlaku dan ia tidak melibatkan kehilangan beban yang besar. Secara keseluruhannya, prestasi sistem minit bagi grid Sabah dan Labuan pada 2022 berada di tahap yang baik dan dalam sasaran yang ditetapkan oleh ST iaitu 50 minit.

## Sabah and Labuan

Over the past five (5) years, the transmission system performance in 2022 has shown good performance, with a decrease in DePUI from 42.97 minutes in 2018 to 1.42 minutes in 2022. This is due to only five (5) load shedding incidents on the 132 kV grid, which did not involve significant load loss. Overall, the system minutes performance for the Sabah and Labuan grid in 2022 was satisfactory and within the target set by the Commission, which is 50 minutes.



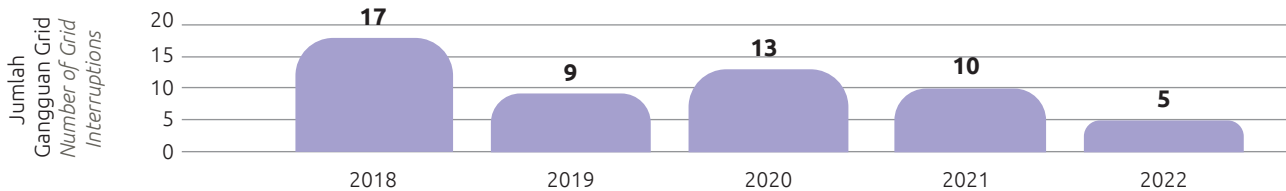
**Prestasi DePUI di Sabah dan Labuan (SESB), 2018-2022**  
*DePUI Performance in Sabah and Labuan (SESB), 2018-2022*



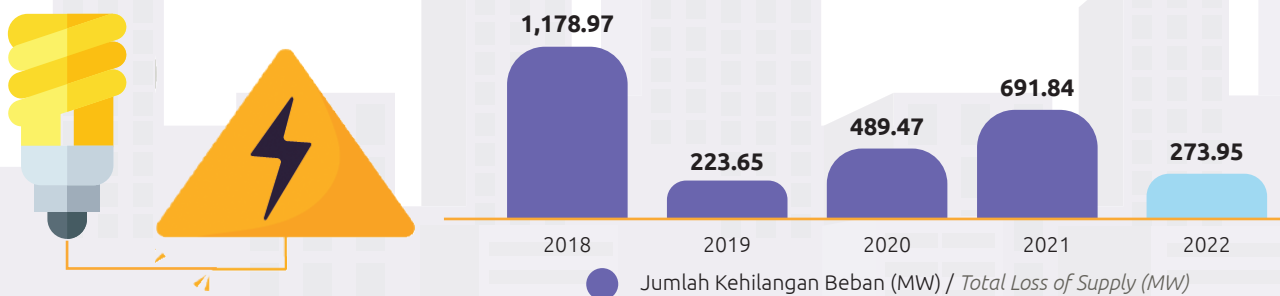
Terdapat penurunan bilangan insiden lucutan beban daripada 10 insiden pada 2021 kepada lima (5) insiden pada 2022. Sebanyak 273.95 MW kehilangan bekalan akibat gangguan di sistem grid dicatatkan, penurunan sebanyak 60% berbanding 691.84 MW pada 2021.

*The number of load shedding incidents decreased from 10 incidents in 2021 to five (5) incidents in 2022. A total of 273.95 MW of supply loss due to grid system interruptions was recorded, which represents a decrease of 60% compared to 691.84 MW in 2021.*

**Jumlah Insiden Kehilangan Bekan Berpunca daripada Gangguan Sistem Grid di Sabah dan Labuan, 2018-2022**  
*Total Load Loss Incidents Due to Grid System Interruptions in Sabah and Labuan, 2018-2022*



**Kehilangan Bekalan di Sabah dan Labuan, 2018-2022**  
*Loss of Supply in Sabah and Labuan, 2018-2022*



Secara keseluruhannya, prestasi talian penghantaran bagi Semenanjung, Sabah dan Labuan berada di tahap yang baik dan berada dalam sasaran yang ditetapkan oleh ST.

*Overall, the transmission system performance for the Peninsula, Sabah and Labuan is at a good level and within the targets set by the Commission.*

# Prestasi Sistem Pengagihan

## *Distribution System Performance*

### SAIDI, SAIFI dan CAIDI Elektrik

#### Semenanjung

Bagi 2022, sasaran *System Average Interruption Duration Index* (SAIDI) di Semenanjung yang ditetapkan kekal di bawah 55 minit/pelanggan/tahun seperti 2021.

Dalam memastikan pencapaian SAIDI di Semenanjung kekal di bawah sasaran, pemantauan dilakukan bagi Selangor dan Kedah, yang masing-masing mencatatkan SAIDI yang tinggi dan melebihi sasaran ditetapkan. Aktiviti pemantauan memberi fokus kepada pelan tindak mitigasi yang perlu dilaksanakan. Berikutan inisiatif tersebut, pada 2022, prestasi SAIDI di Selangor dan Kedah turun ke bawah sasaran SAIDI masing-masing.

Selain itu, pemantauan bagi *TOP20 Worst Performing Feeder* (WPF) dan *TOP20 SAIDI-Worst Performing Feeder* (SWPF) turut dilaksanakan pada 2022 bagi memantau pembekal yang bermasalah dan kerap mengalami kerosakan.

Secara keseluruhannya, pencapaian prestasi SAIDI terkumpul Semenanjung menunjukkan prestasi yang baik dengan catatan SAIDI sebanyak 45.06 minit/pelanggan/tahun pada 2022, berbanding 45.25 minit/pelanggan/tahun pada 2021. Ini bersamaan dengan penurunan sebanyak 0.42%.

Walaupun terdapat sedikit peningkatan, prestasi *System Average Interruption Frequency Index* (SAIFI) dan *Customer Average Interruption Duration Index* (CAIDI) di Semenanjung masih lagi menunjukkan prestasi yang baik hasil daripada usaha bersama untuk memastikan sistem pengagihan elektrik di Semenanjung berada dalam keadaan yang terkawal.

#### Sabah

Pada 2022, sasaran SAIDI yang ditetapkan bagi Sabah adalah sebanyak 300 minit/pelanggan/tahun.

### *Electricity SAIDI, SAIFI and CAIDI*

#### *The Peninsula*

*For 2022, the System Average Interruption Duration Index (SAIDI) target in the Peninsula remains below 55 minutes/customer/year, as it was in 2021.*

*To ensure that the Peninsula's SAIDI performance stays below the target, monitoring is carried out in Selangor and Kedah, which have recorded high SAIDI values exceeding the set targets. The monitoring activities focus on implementing mitigation plans. As a result of the initiative, in 2022, the SAIDI performance in Selangor and Kedah improved and dropped below their respective SAIDI targets.*

*Additionally, monitoring for the TOP20 Worst Performing Feeder (WPF) and TOP20 SAIDI-Worst Performing Feeder (SWPF) was carried out in 2022 to monitor problematic and frequently damaged feeders.*

*Overall, the cumulative SAIDI performance in the Peninsula has shown good results, with a SAIDI record of 45.06 minutes/customer/year in 2022, compared to 45.25 minutes/customer/year in 2021. This represents a decrease of 0.42%.*

*Although there has been a slight increase, the performance of the System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI) in the Peninsula still shows good performance, reflecting the collective efforts to ensure the electrical distribution system in the Peninsula remains well-controlled.*

#### *Sabah*

*In 2022, the target SAIDI set for Sabah was 300 minutes/customer/year.*

Sehingga 31 Disember 2022, pencapaian SAIDI di Sabah berjaya mencapai sasaran yang ditetapkan dengan catatan 286.22 minit/pelanggan/tahun.

Pengiraan SAIDI pada 2022 adalah berdasarkan penggunaan data *Electronic Customer and Outage Management System* (ECOMS) dan pengecualian ke atas SAIDI bagi *Shut Down for System Improvement* dan sebarang insiden gangguan bekalan yang disebabkan oleh kegagalan penjana tenaga bebas untuk beroperasi.

Pada 2022, Pasukan Petugas Khas Penurunan SAIDI 150 yang ditubuhkan untuk menganalisa dan mengenal pasti faktor-faktor yang menyumbang kepada SAIDI telah bersidang sebanyak dua (2) kali serta mengadakan sesi lawatan ke tapak projek bagi mendapatkan gambaran sebenar tentang prestasi projek pembekalan elektrik yang dilaksanakan oleh SESB. Di bawah pemantauan Pasukan Petugas Khas ini, bahagian penghantaran dan penjaan telah menunjukkan penurunan purata SAIDI masing-masing sebanyak 87% dan 40% berbanding 2021.

Pada 2022, kadar SAIFI mengalami penurunan kepada 11.07 gangguan/pelanggan/tahun berbanding 12.10 gangguan/pelanggan/tahun pada 2021.

Pelbagai inisiatif giat dijalankan bagi mengatasi kekerapan gangguan yang disebabkan oleh gangguan pokok dan haiwan yang menjadi penyumbang utama kepada peningkatan SAIDI bagi negeri tersebut.

CAIDI bagi Sabah pada 2022 pula dicatatkan pada 25.86 minit berikutan penutupan bekalan bagi kerja-kerja menaik taraf sistem bekalan.

## **SAIDI Sistem Bekalan Gas Berpaip untuk Sektor Bukan Tenaga**

### **Semenanjung**

Daya harap talian paip pengagihan gas asli di Semenanjung terus dipantau berdasarkan pencapaian SAIDI oleh GMD. Sasaran SAIDI yang ditetapkan bagi tahun 2022 berada di bawah 3.4505 minit/pelanggan seperti tahun 2021. Bagi tahun 2022, bacaan SAIDI di Semenanjung menunjukkan prestasi yang baik iaitu 0 minit/pelanggan berbanding 1.4393 pada tahun 2021.

*As of 31 December 2022, the SAIDI performance in Sabah has successfully achieved the set target with a record of 286.22 minutes/customer/year.*

*The calculation of SAIDI in 2022 is based on the usage of data from the Electronic Customer and Outage Management System (ECOMS), with exceptions made for SAIDI related to Shut Down for System Improvement and any supply disruption incidents caused by the failure of independent power generators to operate.*

*In 2022, the SAIDI Reduction Special Task Force, which was established to analyse and identify factors contributing to SAIDI, held two (2) meetings and conducted site visits to project sites to gain a better understanding of the performance of electricity supply projects implemented by SESB. Under the monitoring of this Special Task Force, the distribution and generation sectors have shown an average reduction in SAIDI by 87% and 40%, respectively, compared to 2021.*

*In 2022, the SAIFI rate decreased to 11.07 interruptions/customer/year compared to 12.10 interruptions/customer/year in 2021.*

*Various proactive initiatives were implemented to address the frequency of interruptions caused by trees and animals, which are the main contributors to the increase in SAIDI in the state.*

*The CAIDI for Sabah in 2022 was recorded at 25.86 minutes due to the shutdown of supply for upgrading works.*

## **Piped Gas Supply System SAIDI in the Non-Energy Sector**

### **The Peninsula**

*The reliability of the natural gas distribution pipeline system in the Peninsula is continuously monitored based on the SAIDI performance by GMD. The SAIDI target set for 2022 remains below 3.4505 minutes/customer, similar to 2021. For the year 2022, the SAIDI reading in the Peninsula indicates a good performance of 0 minutes/customer compared to 1.4393 in 2021.*

## Prestasi Kualiti Kuasa

### Power Quality Performance

#### Kejadian Junaman Voltan

Sebanyak 752 kejadian junaman voltan direkodkan oleh Power Quality Management System (PQMS) TNB di Semenanjung bagi 2022, berbanding 673 kejadian pada 2021. Nilai SARFI<sub>70</sub> bagi TNB mencatatkan peningkatan sebanyak 50 kepada 282 bagi 2022 berbanding 232 pada 2021.

Johor mencatatkan rekod SARFI<sub>70</sub> tertinggi iaitu pada nilai 52, diikuti Terengganu sebanyak 39 dan Pahang dengan catatan 34.

Bilangan aduan tertinggi yang direkodkan adalah di Pulau Pinang iaitu 325 aduan dengan bilangan pengguna yang terlibat dalam kejadian junaman voltan adalah seramai 97 pengguna. Bagaimanapun, bilangan kejadian junaman voltan tertinggi adalah di Pahang iaitu sebanyak 122 kejadian dengan jumlah pengguna yang terlibat sebanyak 13 pengguna.

#### Voltage Sag Incidents

A total of 752 voltage sag incidents were recorded by TNB's Power Quality Management System (PQMS) in the Peninsula for 2022, compared to 673 incidents in 2021. The SARFI<sub>70</sub> value for TNB increased by 50 to 282 in 2022, compared to 232 in 2021.

Johor recorded the highest SARFI<sub>70</sub> value with 52, followed by Terengganu (39) and Pahang (34).

The highest number of complaints recorded was in Penang, with 325 complaints involving 97 affected users in voltage sag incidents. However, the highest number of voltage sag incidents occurred in Pahang, with 122 incidents involving 13 affected users.

## Pematuhan terhadap Tahap Perkhidmatan yang Dijamin (GSL) dan Tahap Perkhidmatan Minimum (MSL) bagi Sektor Bekalan Elektrik

### Compliance of the Guaranteed Service Levels (GSL) and Minimum Service Levels (MSL) for the Electricity Supply Sector

#### Tahap Perkhidmatan Yang Dijamin (GSL) Elektrik

Pencapaian keseluruhan untuk Tahap Perkhidmatan yang Dijamin (GSL) bagi 2022 adalah lebih tinggi iaitu sebanyak 99.73% berbanding 98.82% pada 2021.

GSL 1, GSL 3 dan GSL 5 telah mencatatkan 100% pencapaian dimana setiap permohonan dapat diselesaikan dalam waktu yang ditetapkan. Pencapaian bagi GSL 2 pula mencatatkan 95.1% dan GSL 4 sebanyak 99.84%.

#### Electricity Guaranteed Service Levels (GSL)

The overall Guaranteed Service Level (GSL) for 2022 was 99.73%, which was higher than that of 2021 (98.82%).

GSL 1, GSL 3 and GSL 5 recorded a 100% performance, in which every request was resolved within the designated time frame. Meanwhile, GSL 2 recorded a performance of 95.1%, while GSL 4 recorded a 99.84% performance.



## Tahap Perkhidmatan Minimum (MSL) Elektrik

Pencapaian keseluruhan Tahap Perkhidmatan Minimum (MSL) juga didapati meningkat dari 96.79% pada 2021 kepada 97.31% pada 2022. Kesemua MSL telah mencatatkan nilai pencapaian masing-masing melebihi 90%.

Pelbagai inisiatif telah dijalankan di antara ST dan TNB dalam memudah cara pengguna bagi membuat permohonan rebat GSL dan tuntutan *overvoltage* melalui aplikasi myTNB, termasuk kemudahan untuk menyemak status permohonan tuntutan.

Sebagai pengukur kepada tahap keberkesanan penyampaian perkhidmatan TNB dalam membekalkan elektrik, ST telah menetapkan sembilan (9) Pematuhan MSL sebagai penunjuk prestasi di dalam *Key Performance Index* (KPI) IBR RP3. Ianya merupakan tambahan sebanyak lapan (8) pematuhan berbanding hanya satu (1) sebelum ini.

Pencapaian Standard Prestasi Perkhidmatan Bekalan Elektrik TNB terus dipantau bagi meningkatkan tahap prestasi perkhidmatan TNB dan seterusnya tahap pengalaman pengguna.

## *Electricity Minimum Service Levels (MSL)*

*The overall performance of the Minimum Service Level (MSL) has also improved from 96.79% in 2021 to 97.31% in 2022. All MSLs have achieved performance values exceeding 90%.*

*Various initiatives have been implemented between the Commission and TNB to facilitate users in applying for GSL rebates and overvoltage claims through the myTNB application, including the facility to check the status of claim applications.*

*As a measure of the level of effectiveness of TNB's service delivery in supplying electricity, the Commission has set nine (9) MSL Compliance as performance indicators in the Key Performance Index (KPI) of IBR RP3. It is an addition of eight (8) compliances compared to only one (1) previously.*

*The performance of TNB Electricity Supply Service Performance Standards is continuously monitored to improve TNB's service performance and subsequently enhance the user experience.*

## Kajian Indeks Kepuasan Pelanggan TNB (CSI-TNB)

### *TNB Customer Satisfaction Index (CSI-TNB) Survey*

Objektif Kajian Indeks Kepuasan Pelanggan TNB (CSI-TNB) adalah bagi mencapai dan mengekalkan kualiti khidmat pelanggan yang terbaik, khususnya bagi:

- Mendapatkan tahap kepuasan pelanggan merentasi semua segmen.
- Mengenal pasti jurang di antara jangkaan pelanggan dan perkhidmatan yang diberikan bagi menambah baik kualiti perkhidmatan.
- Menghasilkan pelan tindakan strategik bagi memenuhi keperluan pelanggan.

*The objective of the TNB Customer Satisfaction Index (CSI-TNB) Study is to achieve and maintain the best quality of customer service, particularly in:*

- *Attaining customer satisfaction levels across all segments.*
- *Identifying gaps between customer expectations and the services provided to improve service quality.*
- *Developing strategic action plans to meet customer needs.*

Sebagai penambahbaikan, pada 2022, soalan temuramah turut mengkaji aspek amalan pelanggan di bawah skop kecekapan tenaga, serta tahap kepuasan pelanggan berkaitan notis pemberitahuan pemasangan dan kualiti hasil kerja pemasangan meter pintar.

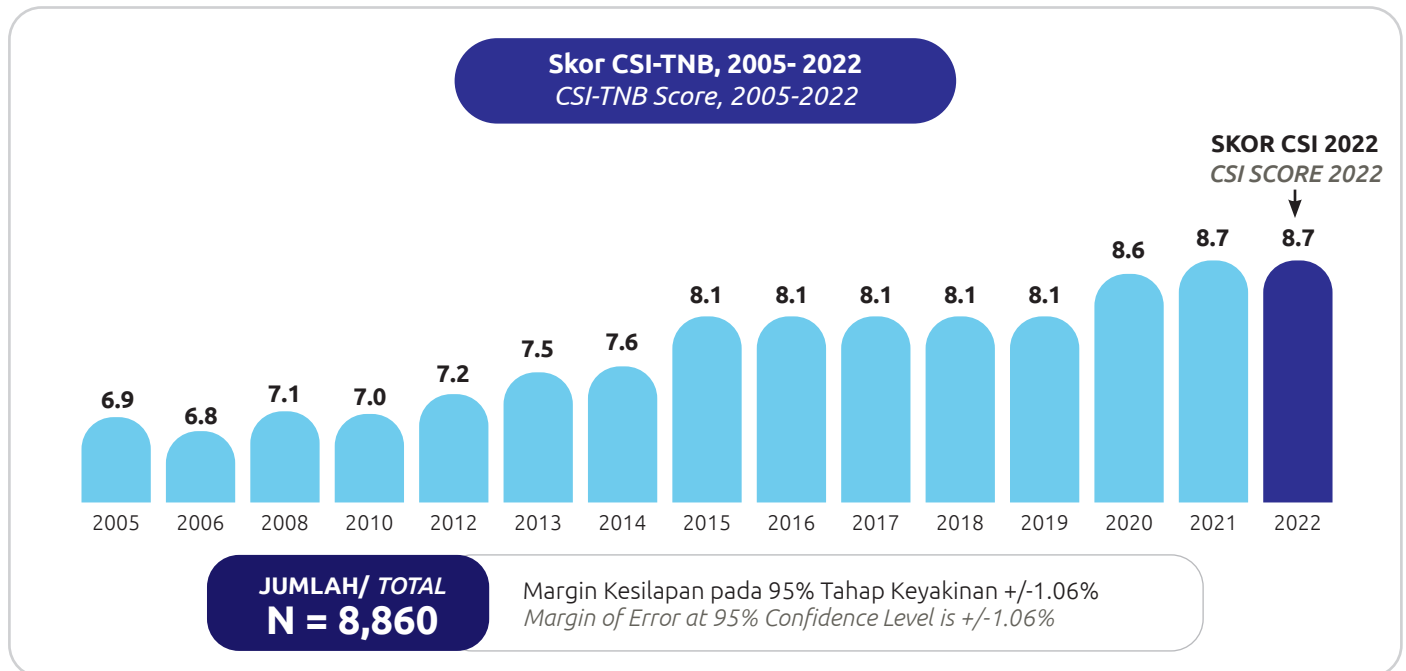
*As an improvement, in 2022, the interview questions also examined aspects of customer practices within the scope of energy efficiency, as well as the level of customer satisfaction related to installation notification notices and the quality of smart meter installation work.*

TNB memulakan kajian lapangan CSI-TNB dari 5 Oktober hingga 15 Disember 2022 bagi seluruh Semenanjung. Sebanyak 8,680 responden dipilih dan ditemuramah secara bersemuka bagi mendapatkan data yang tepat.

*TNB initiated the CSI-TNB field study from 5 October to 15 December 2022, covering the whole Peninsula. A total of 8,680 respondents were selected and interviewed face-to-face to obtain accurate data.*

Hasil kajian CSI-TNB pada 2022 merekodkan skor sebanyak 8.7, kekal tidak berubah berbanding skor pada 2021.

*The results of the CSI-TNB study in 2022 recorded a score of 8.7, remain unchanged compared to the score in 2021.*



## 18 Elemen yang Diambil Kira Dalam Pengiraan Skor CSI-TNB

### 18 Elements Considered in the CSI-TNB Score Calculation

- Penyambungan Baharu/Naik Taraf atau Turun Taraf Sambungan/Perubahan Penyewaan/Penutupan Akaun/  
*New Connection/Connection Upgrade or Downgrade/Change of Tenancy/Close of Account*
- Daya Harap dan Kualiti Bekalan/*Reliability and Quality of Supply*
- Henti Tugas yang Dirancang/*Planned Shutdown*
- Kerosakan dan Pemulihan/*Breakdown and Restoration*
- Kualiti Kuasa/*Power Quality*
- Keselamatan/*Safety*
- Meter/*Meter*
- Caj/*Billing*
- Pembayaran/*Payment*
- Pengendalian Pertanyaan/*Enquiries Handling*
- Pengendalian Aduan/*Complaints Handling*
- Kedai Tenaga
- Kios Layan Diri/*Self Service Kiosk*
- Talian Khidmat Pelanggan TNB (15454 atau 1-300-88-5454)/*TNB Careline (15454 or 1-300-88-5454)*
- Talian Khidmat Pelanggan TNB Facebook/*TNB Careline Facebook Page*
- Pengurus Akaun/Warga Kerja TNB /*Account Manager/TNB Staff*
- Portal myTNB/*myTNB Portal*
- Aplikasi Mudah Alih myTNB/*myTNB Mobile Application*

## Sorotan Utama

### Main Highlights

#### Anugerah Pengiktirafan Khas PEMUDAH

Sempena sambutan ulang tahun Pasukan Petugas Khas Pemudahcara Perniagaan (PEMUDAH) yang ke-15, ST telah menerima Anugerah Pengiktirafan Khas pada Februari 2022 atas dedikasi dan komitmen ke arah penyediaan persekitaran perniagaan yang bersesuaian, khususnya dalam kemudahan untuk mendapatkan bekalan elektrik.

Antara sumbangan ST yang diberi pengiktirafan termasuk kerjasama dengan PEMUDAH dan pihak industri untuk menyelesaikan isu kualiti kuasa, melalui *Technical Working Group on Getting Electricity (TWGGE)*. Kumpulan kerja ini dipengerusikan oleh ST dan disertai PEMUDAH, Malaysia Productivity Corporation (MPC), TNB dan pengamal industri. Hasil inisiatif oleh TWGGE, jumlah aduan berkaitan isu kualiti kuasa didapati semakin berkurangan.

#### Special Recognition Award from PEMUDAH

*In conjunction with the 15<sup>th</sup> anniversary celebration of the Special Task Force to Facilitate Business (PEMUDAH), the Commission received a Special Recognition Award in February 2022 for its dedication and commitment towards providing a conducive business environment, particularly in facilitating access to electrical supply.*

*Among the Commission's recognised contributions were collaborations with PEMUDAH and industry players to address power quality issues through the Technical Working Group on Getting Electricity (TWGGE). This working group, chaired by the Commission and involving PEMUDAH, Malaysia Productivity Corporation (MPC), TNB, and industry practitioners, has successfully reduced the number of complaints related to power quality issues through its initiatives.*

PEMUDAH dipengerusikan bersama oleh YB Dato' Sri Mustapha Mohamed, Menteri di Jabatan Perdana Menteri (Ekonomi), Tan Sri Dato' Seri Mohd Zuki bin Ali Ketua Setiausaha Negara, dan Dato' Dr. Ir. Andy Seo Kian Haw.

*PEMUDAH is jointly chaired by YB Dato' Sri Mustapha Mohamed, Minister in the Prime Minister's Department (Economy), Tan Sri Dato' Seri Mohd Zuki bin Ali, Chief Secretary to the Government, and Dato' Dr. Ir. Andy Seo Kian Haw.*



**Sijil Anugerah Khas PEMUDAH 2022**  
*Special Award Certificate for PEMUDAH 2022*

## **Pulau Tenaga Hijau – Projek Pembekalan Elektrik di Pulau Redang, Pulau Perhentian dan Pulau Tioman**

Perdana Menteri semasa Majlis Perasmian 5<sup>th</sup> *International Sustainable Energy Summit* (ISES) pada 29 Ogos 2022 mengumumkan bahawa Kerajaan akan melaksanakan inisiatif perintis pembangunan Pulau Redang, Pulau Perhentian dan Pulau Tioman bagi menyediakan bekalan elektrik yang konsisten, mampu bayar dan rendah pelepasan karbon.

Projek yang diberi nama Pulau Tenaga Hijau (PTH) ini akan menjadi projek perintis bagi pembekalan elektrik di pulau-pulau lain yang berasaskan sumber TBB dengan tiga (3) teras utama:

- Pengurangan kos operasi pembekalan elektrik dengan sumber TBB
- Penggunaan teknologi Grid Pintar
- Peningkatan daya harap sistem

## **Green Energy Island – Electricity Supply Project in Redang Island, Perhentian Island and Tioman Island**

*During the 5<sup>th</sup> International Sustainable Energy Summit (ISES) inaugural ceremony on 29 August 2022, the Prime Minister announced that the Government would undertake pioneering initiatives for the development of Redang Island, Perhentian Island, and Tioman Island to provide consistent, affordable, and low-carbon electricity supply.*

*The project, named Green Energy Island (also known as PTH), will serve as a pilot project for electricity supply in other off grids islands based on RE sources with three (3) core elements:*

- *Reduction of operational cost of electricity supply with RE sources*
- *Utilisation of Smart Grid technology*
- *Enhancement of system reliability*



Projek PTH adalah berteraskan penggunaan tenaga yang lebih lestari dan mesra alam, iaitu dengan menggunakan teknologi *Rooftop Solar PV*, *Vertical Axis Wind Turbine* (VAWT) dan gas asli cecair (LNG) sebagai sumber penjanaan elektrik, dan disokong dengan infrastruktur Grid Pintar.

Cadangan yang diberikan adalah berdasarkan pemasangan 2 MW Solar PV, 2 MWh *Battery Energy Storage System* (BESS) dan 9 MW tenaga yang dijana oleh LNG bagi Pulau Perhentian dan Pulau Redang. Jumlah kapasiti ini mampu menampung unjuran beban sehingga 2040.

Infrastruktur Grid Pintar dan Meter Pintar, *Geographic Information System* (GIS), BESS, *Energy Management System* (EMS) dan *Supervisory Control and Data Acquisition/Distribution Automation* (SCADA/DA) juga akan dipasang di seluruh pulau bagi persediaan untuk menerima lebih banyak penjanaan berasaskan TBB serta mengurus penjanaan TBB dengan lebih efisien dan efektif.

Sistem retikulasi yang lebih terancang juga akan dibina di seluruh pulau bagi memastikan bekalan elektrik yang stabil dapat dinikmati oleh penduduk pulau.

Pelaksanaan projek PTH ini merupakan satu kejayaan ST dalam pembangunan tenaga lestari negara di samping dapat menyokong hasrat Kerajaan untuk pelepasan karbon sifar bersih menjelang 2050.

*The PTH project is based on the use of more sustainable and environmentally friendly energy sources, namely Rooftop Solar PV technology, Vertical Axis Wind Turbine (VAWT), and liquefied natural gas (LNG) as the sources of electricity generation, supported by Smart Grid infrastructure.*

*The proposed installation includes 2 MW Solar PV, 2 MWh Battery Energy Storage System (BESS), and 9 MW of LNG-generated power for Perhentian Island and Redang Island. This capacity is capable of accommodating forecasted load until 2040.*

*Smart Grid infrastructure, Smart Meters, Geographic Information System (GIS), BESS, Energy Management System (EMS), and Supervisory Control and Data Acquisition/Distribution Automation (SCADA/DA) will also be installed across the islands in preparation for receiving more RE-based generation and to manage the RE generation efficiently and effectively.*

*A well-planned reticulation system will also be built across the islands to ensure a stable electricity supply for the islands' residents.*

*The implementation of the PTH project is a success for the Commission in the development of sustainable energy in the country while also supporting the government's goal of achieving net-zero carbon emissions by 2050.*

**PULAU TENAGA HIJAU GREEN ENERGY ISLAND**

**Objektif Objective**

Sebagai projek perintis pembekalan elektrik berasaskan sumber rendah karbon dan tenaga boleh baharu di Pulau melalui **3 teras utama**

*As a pioneer for low carbon and renewable energy based electricity supply projects on islands with **three (3) core elements**.*

**01 Pengurangan Kos Operasi Operation Cost Reduction**

- Jana kuasa Gas Asli Natural Gas Power Plant
- PV Solar & Turbin Angin Berkusasa Benda PV Solar & Low-power Wind Turbine

**02 Peningkatan Dayaharap Sistem Increased System Reliability**

- Sistem Pengagihan Distribusi System
- Penggunaan Consumer

**03 Teknologi Smart Grid Smart Grid Technology**

- SCADA & DA
- AMI
- EMS
- GIS
- LED

**2022**

- Beliajan CO<sub>2</sub> = 11,476 tan CO<sub>2</sub> eq
- CO<sub>2</sub> emission = 11,476 tan CO<sub>2</sub> eq
- Beliajan CO<sub>2</sub> = 31,891 tan CO<sub>2</sub> eq
- CO<sub>2</sub> emission = 31,891 tan CO<sub>2</sub> eq

**2025**

- 250,754 tan CO<sub>2</sub> eq
- 250,754 tan CO<sub>2</sub> eq
- 400,552 tan CO<sub>2</sub> eq
- 400,552 tan CO<sub>2</sub> eq

**2050 RE 100%**

## Meter Pintar

Penukaran Meter Pintar telah bermula pada 2018 di Melaka dan kini sedang giat dilaksanakan di sekitar Lembah Klang.

Memandangkan jumlah Meter Pintar yang ditukar adalah agak tinggi, *Task Force for Smart Meter Features* ditubuhkan bagi merealisasikan hasil yang diharapkan dan dapat mencapai keberkesanan yang holistik dalam penggunaan Meter Pintar dengan ciri-ciri yang ditawarkan kepada pengguna.

## Smart Meter

*The Smart Meter replacement programme began in 2018 in Melaka and is now being actively implemented in the Klang Valley area.*

*Considering the large number of Smart Meters being replaced, the Task Force for Smart Meter Features was established to achieve the desired outcomes and ensure holistic effectiveness in the use of Smart Meters with the features offered to consumers.*

### Ciri-ciri Meter Pintar dan Status Terkini *Smart Meter Features and Status Updates*

Ciri - Ciri / Features	Status Terkini / Status Updates
Ketersediaan Bil Sebenar <i>Real-Time Billing</i>	Telah disediakan di portal/aplikasi mudah alih myTNB <i>Available on myTNB portal/application</i>
Pengurusan Penggunaan Elektrik Secara Daily Profile <i>Electricity Usage Management via Daily Profile</i>	Telah disediakan di portal/aplikasi mudah alih myTNB <i>Available on myTNB portal/application</i>
<i>Energy Budget</i>	Pengguna berpeluang untuk menggunakan ciri Energy Budget di myTNB bermula 21 Februari 2022 <i>Users can utilise the Energy Budget feature on myTNB starting from 21 February 2022</i>
<i>Remote Energisation and De-Energisation</i>	Masih di peringkat pembangunan dan <i>pilot project</i> dijangka diadakan bermula di Melaka Barat pada 2023 <i>Still in the development stage, with a pilot project expected to commence in West Melaka in 2023</i>
Notifikasi Gangguan Bekalan Dan Pemulihan Bekalan Elektrik <i>Notification of Supply Interruption and Restoration of Electricity Supply</i>	Dijangka akan dilancarkan kepada pengguna pada 2024 <i>Expected to be launched for users in 2024</i>
Skim Prepayment <i>Prepayment Scheme</i>	<i>Pilot project</i> akan dilancarkan pada 2023 <i>A pilot project will be launched in 2023</i>
Pilihan Bagi e-ToU Tarif <i>e-ToU Tariff Options</i>	<i>Pilot project</i> telah selesai dan akan ditawarkan kepada pengguna tarif D dalam masa terdekat <i>Completed pilot project and will be offered to D tariff users in the near future</i>
<i>Digital Bill Rendering</i>	Telah dilancarkan kepada pengguna-pengguna yang terpilih secara berfasa <i>Has been launched for selected users in stages</i>



**Model Meter Pintar terkini**  
*The latest Smart Meter model*

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# Menangani Ketidaktentuan Bekalan Bahan Api Global

## *Addressing Uncertainties in Global Fuel Supplies*

Berikutan pengeluaran arang batu Indonesia yang terjejas akibat faktor cuaca, kekurangan buruh dan beberapa isu rantai bekalan, Kerajaan Indonesia pada 31 Disember 2021 mengeluarkan arahan larangan eksport arang batu kepada pemegang-pemegang permit perlombongannya bagi tempoh 1 hingga 31 Januari 2022. Larangan sementara ini mengakibatkan pelaksanaan catuan penggunaan arang batu di stesen-stesen jana kuasa Semenanjung bagi tujuan penyimpanan stok sedia ada.

Di samping itu, konflik Rusia-Ukraine yang berterusan mengakibatkan sekatan pasaran dan ketidakpastian bekalan komoditi global termasuk arang batu dan gas. Malaysia turut terkesan apabila Kesatuan Eropah dan beberapa negara lain secara rasmi mengharamkan import bahan api Rusia, mengakibatkan harga komoditi terutamanya arang batu meningkat secara mendadak sehingga mencapai paras tertinggi pasaran global iaitu USD415/MT pada Mei 2022.

Situasi domestik seperti penghentian sementara operasi Stesen Jana Kuasa Hidroelektrik Kenyir akibat tanah runtuh, pelucutan beban akibat Pencawang Masuk Utama (PMU) Yong Peng North yang terpelantik serta henti tugas tidak berjadual fasiliti pembekalan gas dan loji-loji arang batu dalam tempoh suku kedua sehingga suku ketiga juga telah memberi cabaran besar kepada industri dalam memastikan sekuriti pembekalan elektrik negara sentiasa terjamin.

Beberapa langkah proaktif diambil bagi menangani isu ini termasuk mengukuhkan hubungan kerjasama Malaysia-Indonesia dan pemantauan terperinci bagi perkembangan bekalan/permintaan serta pasaran arang batu global. Pada masa sama, kerjasama rapat di antara *Single Buyer (SB)*, *Grid System Operator (GSO)* dan *PETRONAS Energy & Gas Trading (PEGT)* diteruskan bagi meminimumkan kesan henti tugas penjanaan elektrik dan fasiliti pembekalan gas kepada sistem.

*Following the decline in Indonesia's coal production due to weather conditions, labour shortages, and various supply chain issues, the Indonesian Government issued a directive on 31 December 2021, imposing a ban on the export of coal to its mining permit holders from 1 to 31 January 2022. This temporary ban has resulted in the implementation of coal rationing in power generation stations in the Peninsula to preserve existing stock reserves.*

*Furthermore, the ongoing Russia-Ukraine conflict has resulted in market restrictions and uncertainties in global commodity supplies, including coal and gas. Malaysia has also been affected as the European Union and several other countries officially banned the import of Russian fuels, causing commodity prices, particularly coal, to sharply increase and reach the highest global market level of USD415/MT in May 2022.*

*Domestic situations such as the temporary suspension of operations of the Kenyir Hydroelectric Power Station due to a landslide, load shedding caused by the tripping of the Yong Peng North Transmission Main Intake (PMU), and the unscheduled shutdown of gas supply facilities and coal-fired power plants in the second quarter until the third quarter have posed significant challenges to the industry in ensuring the security of the country's electricity supply.*

*Several proactive measures have been taken to address this issue, including strengthening Malaysia-Indonesia cooperation and closely monitoring the developments in the supply/demand and global coal market. Simultaneously, close cooperation between *Single Buyer (SB)*, *Grid System Operator (GSO)*, and *PETRONAS Energy & Gas Trading (PEGT)* is maintained to minimise the impact of electricity generation and gas supply facilities shutdowns on the system.*

Di samping itu, ST juga menubuhkan Pasukan Petugas Sekuriti Bahan Api Jangka Pendek (FST) dengan objektif untuk membangunkan strategi aras tinggi dan pelan tindakan dalam menangani cabaran sekuriti bekalan bahan api di Semenanjung. Skop FST kemudiannya diperluas bagi mengesyorkan pelan tindakan komprehensif dalam menjamin sekuriti bekalan elektrik di Semenanjung melangkaui keperluan sekuriti bekalan bahan api sahaja.

Beberapa risiko utama industri pembekalan elektrik telah dikenal pasti melalui satu bengkel anjuran ST bersama pemegang taruh pada 12 Oktober 2022. Antaranya adalah kebergantungan yang tinggi terhadap sumber arang batu dari Indonesia, kekangan gas domestik dan teknologi serta sumber penjanaan yang terhad. Perincian inisiatif bagi menghadapi risiko-risiko ini akan dilaksanakan tahun hadapan.

*Furthermore, the Commission has also established the Short-Term Fuel Security Task Force (FST) with the objective of developing high-level strategies and action plans to address the challenges of fuel supply security in the Peninsula. The scope of the FST has been expanded to recommend a comprehensive action plan to ensure electricity supply security in the Peninsula beyond the requirements of fuel supply security alone.*

*Several key risks in the electricity supply industry have been identified through a workshop organised by the Commission in collaboration with stakeholders on 12 October 2022. These include high dependence on coal sources from Indonesia, domestic gas and technology constraints, and limited generation sources. Detailed initiatives to address these risks will be implemented in the coming year.*

## Pemantauan Kos dan Harga Bekalan Arang Batu

### *Monitoring the Cost and Price of Coal Supply*

Penetapan harga arang batu ke stesen-stesen jana kuasa di Semenanjung adalah melalui mekanisme *Applicable Coal Price* (ACP) yang berdasarkan unjuran harga pasaran merangkumi harga *Free on Board*, kos penghantaran, caj-caj pelabuhan dan insurans arang batu. Pelaksanaan mekanisme ini dipantau oleh Jawatankuasa Pemantauan Kos dan Harga Bekalan Arang Batu (JPKHBAB) yang dipengerusikan oleh ST. Lazimnya, ACP ditetapkan secara suku tahunan dan diisytihar oleh SB kepada stesen-stesen jana kuasa arang batu sekurang-kurangnya sebulan sebelum dikuatkuasakan.

Perolehan arang batu dilaksanakan oleh TNB Fuel Services Sdn. Bhd. berdasarkan kuantiti yang telah ditetapkan dan menggunakan harga pasaran semasa iaitu pada ketika penghantaran dipersetujui oleh TNB Fuel dan pembekal. Perbezaan di antara harga ACP yang diisytihar dengan harga sebenar perolehan arang batu, yang dirujuk sebagai *Fuel Price Adjustment* (FPA), akan dilepaskan kepada pengguna melalui mekanisme *Imbalance Cost Pass-Through* (ICPT).

*The coal prices for power generation stations in the Peninsula are determined through the Applicable Coal Price (ACP) mechanism, which is based on market price estimates, including Free on Board price, transportation costs, port charges and coal insurance. The implementation of this mechanism is monitored by the Coal Supply Cost and Price Monitoring Committee (JPKHBAB) chaired by the Commission. Typically, ACP is set on a quarterly basis and declared by SB to coal-fired power stations at least one month before it is enforced.*

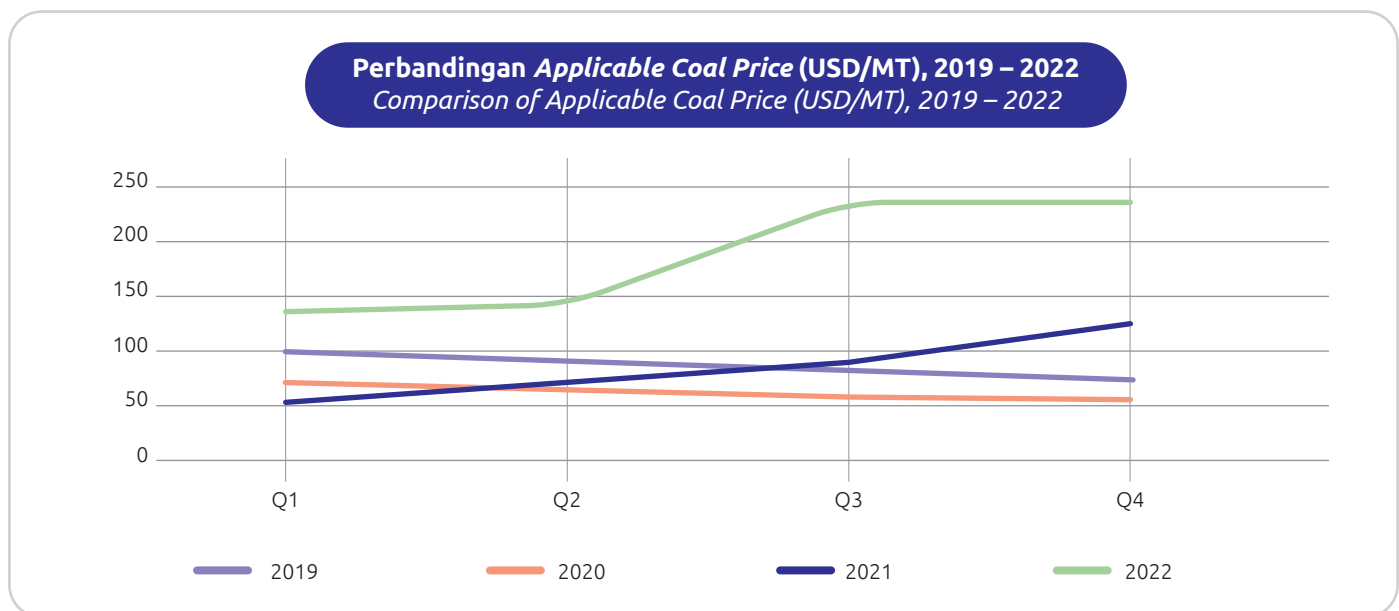
*The procurement of coal is carried out by TNB Fuel Services Sdn. Bhd. based on the predetermined quantity and using the current market price at the time of delivery as agreed upon by TNB Fuel and the supplier. The difference between the declared ACP and the actual procurement cost of coal, referred to as Fuel Price Adjustment (FPA), is passed on to consumers through the Imbalance Cost Pass-Through (ICPT) mechanism.*

Berikutan ketidaktentuan harga arang batu global, jurang perbezaan atau kos FPA ini telah meningkat melebihi 50% memandangkan unjuran harga ACP secara suku adalah jauh berbeza dari harga pasaran semasa. Sehubungan itu, sebagai langkah interim, penetapan ACP secara bulanan telah dilaksanakan bermula Ogos 2022. Penetapan ACP secara suku tahunan akan diteruskan semula apabila trend harga arang batu kembali stabil.

*Due to the uncertainty in global coal prices, the difference for cost of FPA has increased by more than 50% as the quarterly estimated ACP significantly differs from the current market price. Thus, as an interim measure, monthly ACP determination has been implemented starting from August 2022. The quarterly ACP determination will be resumed when the trend in coal prices stabilises again.*

### Applicable Coal Price, 2022

Tempoh Period	ACP (USD/MT)
Suku Tahun Pertama First Quarter	133.78
Suku Tahun Kedua Second Quarter	149.87
Suku Tahun Ketiga Third Quarter	229.33
Ogos August	237.74
September September	227.21
Oktober October	234.62
November November	232.09
Disember December	217.09



Bagi 2022, sebanyak 29.44 juta tan arang batu telah diimport, di mana 20.25 juta tan adalah dari Indonesia, 5.38 juta tan dari Australia, 3.11 juta tan dari Rusia dan 0.70 juta tan dari Afrika Selatan. Pada kapasiti maksimum, jumlah import tahunan berada pada paras 40 juta tan.

Bagi menambah baik perolehan arang batu dalam situasi ketidaktentuan bekalan dan harga bahan api tersebut, JPKHBAB telah menubuhkan satu kumpulan kerja yang mencadangkan beberapa inisiatif termasuk:

- Menyemak kekerapan pengisytiharan ACP kepada stesen-stesen jana kuasa.
- Membuat analisis mengenai penjimatan yang diperolehi melalui penyemakan semula indeks untuk perolehan arang batu.
- Meneliti sumber arang batu dari pembekal atau negara bukan tradisional.
- Menambah kriteria *slagging*, *fouling* dan *enhanced trial burn* untuk penilaian tender teknikal.
- Meningkatkan pemantauan dan pematuhan terhadap tahap stok arang batu minimum di stesen-stesen jana kuasa.
- Menyemak semula tahap stok arang batu minimum di stesen-stesen jana kuasa.
- Meneroka kelebihan dan kelemahan mempunyai simpanan arang batu kebangsaan.
- Mengadakan bengkel kesedaran tentang ACP dan FPA.

*For 2022, a total of 29.44 million tonnes of coal were imported, with 20.25 million tonnes from Indonesia, 5.38 million tonnes from Australia, 3.11 million tonnes from Russia, and 0.70 million tonnes from South Africa. At maximum capacity, the annual import volume stands at 40 million tonnes.*

*To improve coal procurement in the face of uncertain supply and fuel prices, the JPKHBAB has established a working group that proposes several initiatives, including:*

- *Reviewing the frequency of ACP declaration to power stations.*
- *Conducting an analysis on savings gained through revision of index for coal procurement.*
- *Resource scanning of coal from non-traditional suppliers or countries.*
- *Inclusion of criteria for slagging, fouling, and enhanced trial burn for technical tender evaluations.*
- *Enhancing monitoring and compliance to the minimum coal stock levels at power stations.*
- *Reviewing the minimum coal stock levels at power stations.*
- *Exploring the advantages and disadvantages of having a national coal stockpile.*
- *Conducting awareness workshops on ACP and FPA.*

## **Kajian “True Cost of Variable RE (Solar PV) Integration into Power System Network of Peninsular Malaysia”**

### **“True Cost of Variable RE (Solar PV) Integration into Power System Network of Peninsular Malaysia” Study**

Permintaan tinggi terhadap bekalan elektrik dari sumber tenaga boleh baharu (TBB) mendorong pengguna untuk melabur bagi pemasangan panel fotovolt (PV) di premis masing-masing. Penjanaan elektrik melalui solar PV ini membolehkan pengguna mengurangkan pengambilan bekalan elektrik dari pihak utiliti dan seterusnya memberikan penjimatan pada bil bulanan mereka.

*The high demand for electricity supply from renewable energy (RE) sources is driving consumers to invest in the installation of photovoltaic (PV) panels on their premises. Generating electricity through solar PV enables consumers to reduce their reliance on utility power supply, resulting in cost savings on their monthly bills.*



Bagaimanapun, peningkatan kemasukan TBB yang tidak terkawal ke dalam grid terutamanya di pihak pengguna akan memberi implikasi teknikal dan kos kepada keseluruhan sistem pembekalan elektrik. Beberapa kajian dilaksanakan dalam meneliti impak ini termasuk solusi teknikal kepada sistem grid. Di samping itu, analisis turut dijalankan bagi meneliti penambahan kepada kos sistem berikutan penjanaan TBB ini dengan kos infrastruktur yang telah dilaburkan oleh utiliti dalam memenuhi permintaan pengguna.

Berhubung perkara ini, ST sedang mengkaji bagi mendapatkan keseimbangan di antara kos-kos yang terlibat di samping memastikan pembangunan TBB di negara ini mencapai sasaran yang ditetapkan.

Dalam perkembangan sama, pada 2022, kajian “*True Cost of Variable RE (Solar PV) Integration into Power System Network of Peninsular Malaysia*” telah dijalankan untuk mengenal pasti perkara-perkara yang berkaitan dengan kemasukan sistem solar PV. Ini termasuk kos integrasi yang perlu ditanggung oleh sistem untuk menyokong kemasukan solar, kerangka pengagihan kos yang adil kepada pemegang taruh berkaitan serta impak program-program solar kepada pembangunan sosio-ekonomi negara.

Hasil kajian merumuskan mekanisme pengiraan *Net Cost Benefit* (NCB) bagi menilai keutamaan bagi pelaksanaan sesuatu program solar. Nilai NCB yang lebih tinggi bermakna manfaat yang dibawa oleh pelaksanaan program solar tersebut adalah lebih besar kepada sistem. Hasil kajian akan menjadi salah satu rujukan bagi membantu ST dan Kerajaan dalam menentukan program-program solar yang mampu memberi impak positif kepada sistem dan juga pengguna-pengguna elektrik secara amnya.

*However, the uncontrollable increase in RE entry into the grid, especially on the consumer side, poses technical and cost implications for the overall electricity supply system. Several studies were carried out to examine this impact, including technical solutions to the grid system. In addition, analysis was carried out to examine the additional cost to the system resulting from the RE generation and the infrastructure costs invested by utilities to meet consumer demand.*

*In relation to this, the Commission is studying to strike a balance between the involved costs while ensuring that the development of RE in the country achieves the set targets.*

*In the same development, in 2022, a study titled “True Cost of Variable RE (Solar PV) Integration into Power System Network of Peninsular Malaysia” was conducted to identify matters related to the integration of solar PV systems. This includes the integration costs that the system needs to bear to support solar inclusion, the framework for fair cost allocation to stakeholders, and the impact of solar programmes on the socio-economic development of the country.*

*The study results have formulated a mechanism for calculating the Net Cost Benefit (NCB) to assess the priorities for implementing specific solar programmes. A higher NCB value signifies that the implementation of the solar programme brings greater benefits to the system. The study results will serve as a reference to assist the Commission and the Government in determining solar programmes that can have a positive impact on the system and electricity consumers in general.*

## **Pelaksanaan *New Enhanced Dispatch Arrangement* (NEDA)**

### ***Implementation of New Enhanced Dispatch Arrangement (NEDA)***

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*New Enhanced Dispatch Arrangement* (NEDA) merupakan inisiatif yang dilancarkan sejak 2017, bertujuan memberi manfaat kepada negara dengan kos penjanaan yang lebih kompetitif. Butiran pelaksanaan NEDA adalah untuk:

*The New Enhanced Dispatch Arrangement (NEDA) is an initiative launched since 2017, aiming to benefit the country with more competitive generation costs. The implementation details of NEDA are as follows:*

- Meningkatkan kecekapan kos penjanaan melalui persaingan jangka pendek.
- Menggalakkan penggunaan teknologi yang cekap, seperti penglibatan stesen jana kuasa kohana dalam pasaran elektrik.
- Peluang untuk penjana tanpa *Power Purchase Agreement* (PPA) untuk beroperasi sebagai *Merchant Plant* dan menawarkan tenaga kepada SB.
- Meningkatkan opsyen perniagaan untuk penjana PPA yang telah tamat tempoh dan penjana lain dengan memaksimumkan penggunaan fasiliti sedia secara cekap dan kos efektif untuk faedah industri bekalan elektrik dan pengguna.
- *Enhancing cost efficiency in generation through short-term competition.*
- *Encouraging the use of efficient technologies, such as the participation of cogeneration power plants in the electricity market.*
- *Providing opportunities for generators without Power Purchase Agreement (PPA) to operate as Merchant Plants and offer power to SB.*
- *Increasing business options for expired PPA generators and other generators by maximising the efficient and cost-effective utilisation of existing facilities for the benefit of the electricity supply industry and consumers.*

### Stesen Jana Kuasa yang Menyertai NEDA bagi Kategori *Price Taker* *Power Plants Participating in NEDA for the Price Taker Category*

Peserta <i>Participants</i>	Kategori <i>Category</i>	Kapasiti Berdaftar (MW) <i>Registered Capacity (MW)</i>	Hari Dagangan Pertama <i>First Trading Day</i>
NUR Generation	<i>Price Taker (Small Franchise Utility)</i>	29.9	18 Mac 2019 <i>18 March 2019</i>
Petronas Chemicals Fertiliser Kedah (PCFK)	<i>Price Taker (Co-Gen)</i>	8.0	15 Jun 2019 <i>15 June 2019</i>
Perstima Utility	<i>Price Taker (Co-Gen)</i>	3.6	19 September 2019 <i>19 September 2019</i>
PETRONAS Centralised Utility Facility Gebeng	<i>Price Taker (Co-Gen)</i>	29.9	20 Ogos 2021 <i>20 August 2021</i>
PETRONAS Centralised Utility Facility Kertih	<i>Price Taker (Co-Gen)</i>	29.9	20 Ogos 2021 <i>20 August 2021</i>
Eastern Power Resources	<i>Price Taker (Co-Gen)</i>	29.9	22 Julai 2022 <i>22 July 2022</i>

Jumlah penyertaan NEDA meningkat pada 2022 dengan kemasukan Eastern Power Resources dengan kapasiti sebanyak 29.9 MW, menjadikan jumlah keseluruhan penyertaan NEDA sebanyak 131.20 MW.

Selain itu, terdapat tiga (3) stesen jana kuasa solar sedang dalam proses pembangunan dan dijangka mula beroperasi pada 2023 dan 2024. Stesen jana kuasa tersebut merupakan peserta bagi kategori *Price Taker* yang bakal meningkatkan lagi penyertaan NEDA.

Penyertaan ke NEDA melalui pembangunan stesen jana kuasa solar dijangka akan semakin meningkat apabila Kerajaan melancarkan Program Tenaga Hijau Korporat (CGPP). Selaras dengan hasrat Kerajaan untuk meningkatkan penggunaan TBB ke dalam campuran bahan api sektor penjanaan di Semenanjung,

*The number of NEDA participants increased in 2022 with the entry of Eastern Power Resources, with a capacity of 29.9 MW, bringing the total NEDA participation to 131.20 MW.*

*Furthermore, there are three (3) solar power stations currently under development and expected to commence operations in 2023 and 2024. These power stations will participate in the Price Taker category, further increasing NEDA participation.*

*Participation in NEDA through the development of solar power stations is expected to increase as the Government launches the Corporate Green Power Programme (CGPP). Aligned with the Government's objective to increase the use of RE in the fuel mix of the generation sector in the Peninsula, a capacity of 600 MW has been allocated for*

kapasiti sebanyak 600 MW diperuntukkan untuk dibangunkan melalui CGPP. Stesen-stesen jana kuasa solar ini disasarkan untuk mula beroperasi sebelum atau pada 2025.

Penyertaan tinggi daripada peserta NEDA bakal membuka potensi penuh mekanisme NEDA, sekaligus mencapai objektif NEDA untuk mendapatkan kos penjanaan yang lebih kompetitif. Selain itu, penggunaan mekanisme NEDA sebagai kaedah *settlement* bagi CGPP menunjukkan bahawa mekanisme ini lebih telus dan terbuka serta pada masa yang sama meningkatkan kefahaman peserta terhadap harga pasaran tenaga elektrik.

*development under the CGPP. These solar power stations are targeted to commence operations before or in 2025.*

*The high participation from NEDA participants will unlock the full potential of the NEDA mechanism, thus achieving NEDA's objective of obtaining more competitive generation costs. Furthermore, the utilisation of the NEDA mechanism as the settlement method for the CGPP demonstrates its transparency and openness, while also enhancing participants' understanding of market electricity prices.*

## Pemantauan Pelaksanaan *Ring-Fencing* SB dan GSO di Semenanjung

### *Monitoring the Implementation of SB and GSO Ring-Fencing in the Peninsula*

Pemantauan terhadap *ring-fencing* SB dan GSO dilaksana bagi memastikan industri bekalan elektrik sentiasa berdaya saing dan tidak berdiskriminasi selaras dengan fungsi dan tanggungjawab SB dan GSO yang telah digariskan dalam Akta 447 dan garis panduan yang dibangunkan. Aktiviti pemantauan terdiri daripada pelaporan SB dan GSO kepada *Oversight Panel Ring-Fenced Single Buyer and Ring-Fenced Grid System Operator (Oversight Panel)* dan pelaksanaan audit pematuhan di samping beberapa mesyuarat kumpulan kerja seperti yang ditetapkan di bawah garis panduan.

*Monitoring of the ring-fencing of SB and GSO is carried out to ensure that the electricity supply industry remains competitive and non-discriminatory, in line with the functions and responsibilities of SB and GSO outlined in Act 447 and developed guidelines. The monitoring activities consist of reporting by SB and GSO to the Oversight Panel for the Ring-Fenced Single Buyer and Ring-Fenced Grid System Operator (Oversight Panel), as well as compliance audits and several working group meetings as stipulated in the guidelines.*

### ***Oversight Panel for Ring-Fenced Single Buyer and Ring-Fenced Grid System Operator***

*Oversight Panel* ditubuhkan pada 21 November 2013 dengan tujuan bagi pemantauan aktiviti *ring-fenced* SB dan GSO serta pematuhannya terhadap fungsi dan tanggungjawab yang telah digariskan ke atasnya. Ia dipengerusikan oleh Anggota Suruhanjaya Tenaga, dengan keahlian dari kalangan Pegawai KeTSA, Ketua Pegawai Eksekutif ST, Ketua Pegawai Operasi ST, Pakar Teknikal Bebas dan Wakil Pengurusan TNB.

### ***Oversight Panel for Ring-Fenced Single Buyer and Ring-Fenced Grid System Operator***

*The Oversight Panel was established on 21 November 2013, with the purpose of monitoring the activities of ring-fenced SB and GSO and ensuring their compliance with the designated functions and responsibilities. It is chaired by the Commission Member, with membership from the KeTSA, the Commission's CEO and COO, an Independent Technical Expert, and a representative from TNB Management.*

Bagi tahun 2022, mesyuarat *Oversight Panel* diadakan pada 17 Mei 2022 dan 12 Disember 2022, di samping satu mesyuarat khas pada 2 Ogos 2022 bagi membincangkan kaedah pengiraan nilai *System Marginal Price* (SMP).

## **Pelaksanaan Audit Pematuhan SB dan GSO Semenanjung**

Audit pematuhan SB dan GSO telah dilaksanakan oleh syarikat lantikan ST iaitu DNV Singapore PTE. LTD. dengan skop audit bagi 2017-2021 seperti berikut:

- Meneliti dan menilai tahap pematuhan SB dan GSO dalam menjalankan fungsi mereka secara telus, konsisten, adil dan seimbang mengikut keperluan yang ditetapkan dalam *Guidelines for Single Buyer Market (Peninsular Malaysia)*, *Guidelines for Ring-Fencing of the System Operator* dan *Guidelines on Electricity Tariff Determination Under Incentive-Based Regulation (IBR) for Peninsular Malaysia 2018*.
- Menyemak proses, hasil dan laporan SB dan GSO untuk memastikan proses dan prosedur berfungsi mengikut garis panduan dan selari dengan Akta dan peraturan yang berkaitan yang dinyatakan dalam garis panduan.
- Menyemak dan menentukan sama ada aktiviti SB diatur mengikut spesifikasi masa dan memantau pematuhan dengan *Generator Contracts*.
- Meningkatkan daya harap, integriti data dan maklumat, termasuk aliran maklumat dan akses data.
- Mencadangkan penambahbaikan pada garis panduan SB dan GSO berdasarkan dapatan dalam keempat-empat perkara di atas yang boleh meningkatkan ketelusan.
- Pertimbangan terhadap peralihan tenaga atau landskap tenaga yang berubah.

Pelaksanaan audit bermula pada Ogos 2022 bagi tempoh enam (6) bulan dengan beberapa siri audit fizikal di pejabat SB dan GSO. Laporan audit akan dimuktamadkan pada suku pertama 2023 dengan dapatan yang akan digunakan sebagai input untuk penambahbaikan garis-garis panduan sedia ada terutama dengan pembangunan serta transisi dalam industri pembekalan elektrik.

*For 2022, the Oversight Panel held meetings on 17 May 2022 and 12 December 2022, in addition to a special meeting on 2 August 2022, to discuss the calculation method of the System Marginal Price (SMP) value.*

## **Implementation of Compliance Audit for SB and GSO in the Peninsula**

*Compliance audits for SB and GSO were conducted by the Commission's appointed company, DNV Singapore PTE. LTD., with the audit scope covering the period from 2017 to 2021. The audit included the following:*

- *Examine and assess the compliance level of SB and GSO that it performs their functions in a transparent, consistent, fair and balanced manner in accordance to the requirements specified in the Guidelines for Single Buyer Market (Peninsular Malaysia), Guidelines for Ring-Fencing of the System Operator, and Guidelines on Electricity Tariff Determination Under Incentive-Based Regulation (IBR) for Peninsular Malaysia 2018.*
- *Review SB and GSO processes, outcomes, and reports, whether the processes and procedures are operating in compliance with the guidelines and in conjunction with relevant Acts and regulations that is specified in the guidelines.*
- *Review and determine whether SB activities have been arranged in accordance with the time specification and monitor compliance with Generator Contracts.*
- *Strengthen the reliability, integrity of data and information, including information flow and data access.*
- *Recommend improvements to SB and GSO Guidelines with respect to the findings in (i) –(iv) that can enhance transparency.*
- *Consideration of energy transition/changing energy landscape.*

*The audit began in August 2022 for six (6) months, including several physical audit sessions at the SB and GSO offices. The audit report will be finalised in the first quarter of 2023, and the findings will be used as input to improve existing guidelines, particularly in relation to the development and transition within the electricity supply industry.*



## Kumpulan Kerja *Dispatch Scheduling*

Kumpulan Kerja *Dispatch Scheduling* ditubuhkan bagi memberi panduan dan memantau ramalan operasi jangka masa pendek dan sederhana, termasuk perancangan penghantaran beban dan keperluan bahan api. Ia dianggotai oleh pegawai-pegawai ST, SB, GSO dan TNB Distribution dan mesyuarat dijalankan secara suku tahunan.

Antara isu utama yang dibincangkan pada tahun ini adalah berkenaan perancangan operasi kesan daripada isu-isu global yang dihadapi terutamanya kecukupan bahan api gas dan arang batu, penggunaan bahan api alternatif dan perancangan operasi sewaktu henti tugas fasiliti pembekalan gas.

## Kumpulan Kerja *Single Buyer Website*

Kumpulan Kerja *Single Buyer Website* pula berperanan sebagai medium perbincangan bagi penerbitan maklumat dan panduan di laman sesawang SB, dengan keanggotaan terdiri daripada pegawai-pegawai ST, SB, GSO dan TNB ICT. Mesyuarat dijalankan pada 20 April 2022 dengan mengemas kini status perkara berbangkit daripada mesyuarat sebelumnya.

## *Dispatch Scheduling Working Group*

*The Dispatch Scheduling Working Group was established to provide guidance and monitor short to medium-term operational forecasting, including load dispatch planning and fuel requirements. It consists of representatives from ST, SB, GSO, and TNB Distribution, and meetings are held on a quarterly basis.*

*Among the key issues discussed this year were related to operational planning in light of global challenges, particularly the sufficiency of gas and coal fuel supply, the use of alternative fuels, and operational planning during gas supply facility shutdowns.*

## *Single Buyer Website Working Group*

*The Single Buyer Website Working Group serves as a platform for discussions regarding the publication of information and guidelines on the SB website. It consists of representatives from ST, SB, GSO, and TNB ICT. A meeting was held on 20 April 2022 to update the status of the matters discussed in the previous meeting.*

# Garis Panduan SB dan GSO di Sabah dan Labuan

## *SB and GSO Guidelines in Sabah and Labuan*

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Menteri Tenaga dan Sumber Asli pada 12 Ogos 2022 telah bersetuju dengan pelaksanaan *ring-fencing arrangement* bagi SB Sabah dan GSO Sabah menggunakan pendekatan *principles-based* seperti di Semenanjung. Menteri juga turut bersetuju dengan pelantikan *Head of SB* dan *Head of GSO* dan draf perintah pemberian kuasa terhadap kedua-dua entiti tersebut.

*Guidelines for Single Buyer (Sabah and Federal Territory of Labuan) 2022 dan Guidelines for Grid System Operator (Sabah and Federal Territory of Labuan) 2022 yang dibangunkan adalah bertujuan untuk mengelakkan diskriminasi atau persepsi terdapat diskriminasi dalam proses penjadualan dan arahan pengoperasian penjanaan tenaga di Sabah dan Labuan.*

*The Minister of Energy and Natural Resources, on 12 August 2022, agreed to implement a ring-fencing arrangement for SB Sabah and GSO Sabah using a principles-based approach similar to the one in the Peninsula. The Minister also approved the appointment of the Head of SB and Head of GSO and the draft of the power delegation order for both entities.*

*The Guidelines for Single Buyer (Sabah and Federal Territory of Labuan) 2022 and Guidelines for Grid System Operator (Sabah and Federal Territory of Labuan) 2022, were developed with the aim of preventing discrimination or the perception of discrimination in the scheduling and operational directives of power generation in Sabah and Labuan.*

Sepertimana pelaksanaan di Semenanjung, elemen *ring-fencing* adalah bagi memastikan bahawa SB Sabah dan GSO Sabah tidak berpotensi terlibat dalam mana-mana situasi konflik. Perkara ini dilaksanakan melalui pengasingan akaun, operasi dan kod etika kerja di samping mengenal pasti sempadan dan keperluan perkongsian maklumat serta peruntukan kos perbelanjaan dengan tiada diskriminasi dalam mana-mana keputusan yang diambil.

Beberapa perubahan utama yang dibuat kepada kedua-dua garis panduan di Sabah tersebut berbanding garis panduan di Semenanjung adalah berhubung peruntukan yang berkaitan dengan penggunaan arang batu dan NEDA kerana kedua-duanya tidak terpakai di Sabah dan Labuan.

*Similar to the implementation in the Peninsula, the ring-fencing elements are in place to ensure that SB Sabah and GSO Sabah are not potentially involved in any conflict situations. This is implemented through the separation of accounts, operations, and a code of conduct, as well as identifying boundaries and information-sharing requirements, and ensuring non-discriminatory cost allocation in any decision-making processes.*

*Several key changes have been made to both guidelines in Sabah compared to the guidelines in the Peninsula, particularly regarding provisions related to the use of coal and NEDA, as both are not applicable in Sabah and Labuan.*

## Pelaksanaan Kadar Tarif Asas Elektrik di Semenanjung di Bawah Mekanisme Kawal Selia Berasaskan Insentif (IBR) bagi Tempoh Kawal Selia Ketiga (RP3: 2022 – 2024)

### *Implementation of the Electricity Base Tariff Rate in the Peninsula under the Incentive-Based Regulation (IBR) Mechanism for the Third Regulatory Period (RP3: 2022 – 2024)*

Kerajaan pada 5 Januari 2022 memutuskan untuk melaksanakan penetapan kadar purata tarif asas elektrik (tarif asas) baharu bagi TNB di Semenanjung di bawah mekanisme Kawal Selia Berasaskan Insentif (IBR) bagi tempoh kawal selia ketiga (RP3) bermula 1 Februari 2022 hingga 31 Disember 2024, dengan parameter seperti berikut:

*On 5 January 2022, the Government decided to implement a new average electricity base tariff rate (base tariff) for TNB in the Peninsula under the Incentive-Based Regulation (IBR) mechanism for the third regulatory period (RP3) from 1 February 2022 to 31 December 2024, with the following parameters:*

Bil. No.	Parameter Parameter	Keputusan Kerajaan Government's Decision
1.	Kadar Purata Tarif Asas RP3 (2022-2024) <i>RP3 Average Base Tariff Rate (2022-2024)</i>	39.95 sen/kWj 39.95 sen/kWh
2.	Kadar Regulatori <i>Weighted Average Cost of Capital (WACC)</i> <i>Regulatory Rate of the Weighted Average Cost of Capital (WACC)</i>	7.3%
3.	Unjuran Permintaan Elektrik <i>Electricity Demand Forecast</i>	116,795 GWj 116,795 GWh
4.	Andaian Harga Gas <i>Estimated Gas Price</i>	T1:RM26/MMBtu T2: RM33/MMBtu
5.	Andaian Harga Arang Batu <i>Estimated Coal Price</i>	USD 79/MT
6.	Kadar Pertukaran Mata Wang Asing (USD:RM) <i>Foreign Exchange Rates (USD:RM)</i>	RM4.123/1USD

7.	Perbelanjaan Modal (CAPEX) yang Dibenarkan untuk TNB <i>Allowed Capital Expenditure (CAPEX) for TNB</i>	RM6.851 billion
8.	Perbelanjaan Operasi (OPEX) yang Dibenarkan untuk TNB <i>Allowed Operating Expenditure (OPEX) for TNB</i>	RM5.987 billion

Di samping itu, ST juga menetapkan senarai pengukur prestasi baharu bagi tempoh IBR RP3 untuk memantau prestasi TNB dari segi teknikal dan komersial.

Berdasarkan kepada prestasi pembekalan elektrik TNB bagi 2022, ST turut membuat semakan ke atas purata harga jualan (ASP) yang diperolehi TNB bagi 2022 iaitu sekitar 40.06 sen/kWj dan mendapati ia adalah melebihi tarif asas yang ditetapkan bagi tempoh RP3 iaitu pada 39.95 sen/kWj.

Selain itu, berdasarkan semakan ST, lebih jumlah pelarasan hasil tahunan (ARA) TNB dan jumlah pendapatan lain dikenal pasti bagi tempoh Januari hingga Jun 2022 adalah dianggarkan sebanyak RM283.6 juta. Jumlah pelarasan hasil TNB ini akan diselaraskan sebagai pelan mitigasi bagi mengurangkan kadar surcaj tarif yang sepatutnya dikenakan kepada pengguna, tertakluk kepada pertimbangan dan kelulusan Kerajaan.

*In addition, the Commission has also established a new set of performance indicators for the IBR RP3 period to monitor TNB's performance in technical and commercial aspects.*

*Based on TNB's electricity supply performance for 2022, the Commission also reviewed the Average Selling Price (ASP) obtained by TNB for 2022, which is approximately 40.06 sen/kWh, and found that it exceeds the base tariff set for the RP3 period, which is 39.95 sen/kWh.*

*Furthermore, according to the Commission's review, the excess amount of TNB's Annual Revenue Adjustment (ARA) and Other Income identified for the period of January to June 2022 was estimated to be RM283.6 million. This TNB revenue adjustment amount will be reconciled as a mitigation plan to reduce the surcharge rate that should be imposed on consumers, subject to the consideration and approval of the Government.*

## **Pelaksanaan Pelarasan Tarif di Bawah Mekanisme *Imbalance Cost Pass-Through* (ICPT) bagi TNB di Semenanjung**

### ***Implementation of Tariff Adjustments Under the Imbalance Cost Pass-Through (ICPT) Mechanism for TNB in the Peninsula***

Di bawah mekanisme IBR RP3, tarif asas bagi 2022 hingga 2024 ditentukan dengan menetapkan andaian harga penanda aras bahan api arang batu, gas dan lain-lain parameter berkaitan kos penjanaan dalam tempoh tersebut.

Sebarang perbezaan harga sebenar dengan harga penanda aras bahan api dalam penetapan tarif asas akan diselaraskan setiap enam (6) bulan di bawah mekanisme ICPT, sama ada dalam bentuk surcaj atau rebat dan ia bergantung kepada semakan ke atas kos bahan api dan kos penjanaan lain dalam tempoh tersebut.

*Under the IBR RP3 mechanism, the base tariff rates for 2022 to 2024 are determined by setting the benchmark prices for various fuel parameters, such as coal, gas, and other generation cost-related factors during that period.*

*Any actual price differences from the benchmark fuel prices in determining the base tariffs will be adjusted every six (6) months under the ICPT mechanism, either through surcharges or rebates, depending on the review of fuel costs and other generation costs during that period.*

## **Semakan Kuantum ICPT di Semenanjung bagi Pelaksanaan Januari Hingga Jun 2022**

Berdasarkan tempoh semakan ICPT bermula 1 Julai 2021 hingga 31 Disember 2021, berlaku peningkatan dalam kos bahan api dan kos penjanaan lain sebanyak RM1.67 bilion, ekoran kenaikan harga arang batu yang tinggi di pasaran sehingga mencecah USD200 per tan.

Walau bagaimanapun, Kerajaan pada 31 Disember 2021 memutuskan untuk menangguhkan pelaksanaan pelarasan tarif elektrik di bawah mekanisme ICPT mulai 1 Januari 2022 sehingga ke satu tarikh yang akan ditentukan oleh Kerajaan. Rebat sebanyak 2 sen/kWj kepada semua pengguna elektrik di Semenanjung dikekalkan untuk tempoh tersebut.

## **Pelaksanaan Pelarasan Tarif di Bawah Mekanisme ICPT di Semenanjung bagi Tempoh Februari hingga Jun 2022**

Kerajaan telah memutuskan supaya bagi tempoh 1 Februari hingga 30 Jun 2022, pelarasan tarif elektrik di bawah mekanisme ICPT dilaksanakan seperti berikut:

- Pemberian rebat 2 sen/kWj dikekalkan kepada semua pengguna domestik dan tiada surcaj dikenakan. Untuk itu, tiada kenaikan tarif elektrik kepada pengguna-pengguna domestik di Semenanjung.
- Pengenaan surcaj 3.70 sen/kWj kepada semua pengguna bukan domestik seperti komersial dan industri.

Bagi mengekalkan pemberian rebat dan menanggung sepenuhnya kos surcaj ICPT bagi semua pengguna domestik, Kerajaan memperuntukkan sebanyak RM 715 juta daripada dana Kumpulan Wang Industri Elektrik (KWIE).

## **Semakan Kuantum ICPT di Semenanjung bagi Tempoh Pelaksanaan Julai hingga Disember 2022**

Berdasarkan semakan ICPT bagi tempoh 1 Januari 2022 hingga 30 Jun 2022, terdapat peningkatan dalam kos bahan api dan kos penjanaan lain sebanyak RM7.0 bilion atau bersamaan dengan surcaj ICPT pada kadar 11.81 sen/kWj.

## **Review of ICPT Quantum in the Peninsula for the Implementation Period of January to June 2022**

*Based on the review period of ICPT from 1 July 2021 to 31 December 2021, there was an increase in fuel costs and other generation costs amounting to RM1.67 billion due to the high price of coal in the market, reaching up to USD200 per tonne.*

*However, on 31 December 2021, the Government decided to defer the implementation of electricity tariff adjustments under the ICPT mechanism starting from 1 January 2022, until a date to be determined by the Government. A rebate of 2 sen/kWh to all electricity consumers in the Peninsula was maintained for the period.*

## **Implementation of Tariff Adjustment Under the ICPT Mechanism in the Peninsula for the Period of February to June 2022**

*The Government has decided that for the period of February to June 2022, the implementation of electricity tariff adjustments under the ICPT mechanism was as follows:*

- *A rebate of 2 sen/kWh was maintained for all domestic consumers, and no surcharge was imposed. Therefore, there was no increase in electricity tariffs for domestic consumers in the Peninsula.*
- *A surcharge of 3.70 sen/kWh was applied to all non-domestic users, such as commercial and industrial consumers.*

*To maintain the rebate and bear the entire cost of the ICPT surcharge for all domestic consumers, the Government has allocated RM715 million from the Electricity Industry Fund (EIF).*

## **Review of ICPT Quantum in the Peninsula for the Implementation Period of July to December 2022**

*Based on the ICPT review in the period of 1 January 2022 to 30 June 2022, there was an increase in fuel costs and other generation costs amounting to RM7.0 billion or equivalent to surcharge of 11.81 sen/kWh.*



Peningkatan kos bahan api ini adalah ekoran kenaikan harga arang batu yang tinggi di pasaran dunia sehingga mencecah USD265 per tan berbanding dengan kadar USD79 per tan yang diunjurkan dalam kadar tarif asas TNB. Antara sebab kenaikan harga arang batu tersebut ialah krisis global yang berlaku dan kekangan bekalan arang batu dunia.

## **Pelaksanaan Pelarasan Tarif di bawah Mekanisme ICPT di Semenanjung bagi Tempoh Julai hingga Disember 2022**

Kerajaan telah bersetuju supaya pelarasan tarif elektrik di bawah pelaksanaan mekanisme ICPT bagi pengguna di Semenanjung untuk tempoh 1 Julai 2022 hingga 31 Disember 2022 adalah seperti berikut:

- Semua pengguna domestik tidak akan mengalami sebarang kenaikan bil elektrik kerana rebat 2.00 sen/kWj dikekalkan dan tiada sebarang surcaj dikenakan.
- Semua pengguna bukan domestik seperti komersial dan industri tidak akan mengalami sebarang kenaikan bil elektrik kerana surcaj 3.70 sen/kWj dikekalkan.

Kerajaan memperuntukkan dana sebanyak RM2.3 bilion untuk menanggung kos pengekaln pemberian rebat semasa dan keseluruhan kos surcaj ICPT bagi semua pengguna domestik. Selain itu, Kerajaan juga memperuntukkan sejumlah RM3.5 bilion untuk memastikan surcaj ICPT semasa dapat dikekalkan kepada semua pengguna bukan domestik (komersial dan industri), berbanding dikenakan surcaj sepenuhnya sebanyak 11.81 sen/kWj. Ini menjadikan jumlah keseluruhan peruntukan pemberian rebat dan kos surcaj ICPT yang ditanggung oleh Kerajaan berjumlah RM5.8 bilion.

*The increase of fuel cost was due to the high coal price in the global market, reaching up to USD265 per tonne, compared to the projected rate of USD79 per tonne in TNB's base tariff rate. The rise in coal prices can be attributed to the global crisis and the constraints in the coal supply worldwide.*

## **Implementation of Tariff Adjustment Under the ICPT Mechanism in the Peninsula for the Period of July to December 2022**

*The Government has agreed to implement the electricity tariff adjustments under the ICPT mechanism for users in the Peninsula for the period of 1 July 2022 to 31 December 2022, as follows:*

- *All domestic consumers will not experience any increase in their electricity bills as the 2.00 sen/kWh rebate is maintained, and no surcharge is imposed.*
- *All non-domestic consumers, such as the commercial and industrial will not experience any increase in their electricity bills as the 3.70 sen/kWh surcharge is maintained.*

*The Government has allocated a total of RM2.3 billion to subsidise the cost of maintaining the current rebate and fully bear the cost of the ICPT surcharge for all domestic consumers. Additionally, the Government has allocated RM3.5 billion to maintain the current ICPT surcharge for non-domestic consumers (commercial and industrial) instead of imposing the full surcharge amount of 11.81 sen/kWh. The total costs borne by the Government for the ICPT rebates and surcharges amounted to RM 5.8 billion.*

## Pelaksanaan Kadar Tarif Asas Elektrik di Kawasan Perindustrian Kulim Hi-Tech Park (KHTP) di Bawah Mekanisme IBR bagi Tempoh Kawal Selia Kedua (RP2: 2022 – 2024)

### *Implementation of the Electricity Base Tariff Rate in Kulim Hi-Tech Park (KHTP) Industrial Area under the IBR Mechanism for the Second Regulatory Period (RP2: 2022 – 2024)*

Kerajaan pada 26 Januari 2022 telah membuat keputusan mengenai penetapan tarif asas NUR Power Sdn. Bhd. (NUR) di Kulim Hi-Tech Park (KHTP) di bawah mekanisme IBR bagi tempoh kawal selia kedua (RP2) bermula 1 Februari 2022 hingga 31 Disember 2024 dengan parameter berikut:

*On 26 January 2022, the Government has decided on the base tariff determination for NUR Power Sdn. Bhd. (NUR) in Kulim Hi-Tech Park (KHTP) under the IBR mechanism for the second regulatory period (RP2) from 1 February 2022 to 31 December 2024, with the following parameters:*

Bil. No.	Parameter	Keputusan Kerajaan Government's Decision
1.	Kadar Purata Tarif Asas Tempoh Lanjutan RP2 (Tahun 2022-2024) <i>Average Base Tariff Rate for the Extended Period of RP2 (2022-2024)</i>	37.69 sen/kWj 37.69 sen/kWh
2.	Regulatory WACC <i>Regulatory Rate of WACC</i>	7.2%
3.	Perbelanjaan Modal (CAPEX) yang Dibenarkan bagi NUR <i>Allowed Capital Expenditure (CAPEX) for NUR</i>	RM304.36 juta RM304.36 million
4.	Perbelanjaan Operasi (OPEX) yang Dibenarkan bagi NUR <i>Allowed Operating Expenditure (OPEX) for NUR</i>	RM313.35 juta RM313.35 million
5.	Andaian Harga Gas <i>Estimated Gas Prices</i>	RM26/MMBtu

Tarif asas elektrik di KHTP di bawah mekanisme IBR diselaraskan kepada 37.69 sen/kWj bagi tempoh RP2 berbanding 35.70 sen/kWj pada RP1. Ini berikutan semakan semula unjuran harga gas mengikut pasaran semasa dan pertambahan kos modal yang diperlukan untuk memenuhi keperluan kualiti infrastruktur pembekalan elektrik di KHTP.

*The base tariff rate in KHTP under the IBR mechanism has been adjusted to 37.69 sen/kWh for the RP2 period, compared to the RP1 rate of 35.70 sen/kWh. This is due to a reassessment of the projected gas prices based on the current market and the additional capital costs required to meet the quality requirements of the electricity supply infrastructure in KHTP.*

Di samping itu, ST pada 18 November 2021 bersetuju dengan cadangan pengukur prestasi NUR dengan mengambil kira penetapan insentif ataupun penalti yang akan diselaraskan berdasarkan prestasi perkhidmatan sebenar NUR.

*Additionally, on 18 November 2021, the Commission agreed to the proposed performance measurement of NUR, taking into account the determination of incentives or penalties to be adjusted based on NUR's actual service performance.*

## Jadual Baharu Struktur Tarif Elektrik di KHTP di Bawah Mekanisme IBR bagi Tempoh RP2 Bermula 1 Februari 2022 Hingga 31 Disember 2024

Selaras dengan keputusan Kerajaan pada 26 Januari 2022, pemakaian jadual baharu struktur tarif elektrik di KHTP telah berkuatkuasa pada 1 Februari 2022 hingga 31 Disember 2024 iaitu berdasarkan tarif asas yang ditetapkan pada 37.69 sen/kWj dengan mengekalkan kadar sedia ada untuk pengguna domestik.

Berdasarkan analisis, kenaikan purata sebanyak 4.5% ke atas struktur tarif sedia ada adalah memadai untuk mencapai purata kadar tarif asas yang ditetapkan sebanyak 37.69 sen/kWj.

## New Electricity Tariff Structure Schedule in KHTP Under the IBR Mechanism for the RP2 Period from 1 February 2022 to 31 December 2024

In line with the Government's decision on 26 January 2022, the new electricity tariff structure schedule in KHTP has been implemented to be effective from 1 February 2022 to 31 December 2024, based on the base tariff of 37.69 sen/kWh, while maintaining the existing rate for domestic consumers.

Based on the analysis, an average increase of 4.5% on the existing tariff structure is deemed sufficient to achieve the target average base tariff rate of 37.69 sen/kWh.

Kategori Tarif Tariff Category	Parameter Parameter	Keputusan Kerajaan Government's Decision
<b>Tarif N1 / Tariff N1:</b> Tarif Domestik Domestic Tariff	200 kWj pertama First 200 kWh	sen/kWj sen/kWh 21.80
	201-300 kWj 201-300 kWh	sen/kWj sen/kWh 33.40
	301-600 kWj 301-600 kWh	sen/kWj sen/kWh 51.60
	601-900 kWj 601-900 kWh	sen/kWj sen/kWh 54.60
	901 kWj dan ke atas 901 kWh and above	sen/kWj sen/kWh 57.10
<b>Tarif N2 / Tariff N2:</b> Tarif Komersial Voltan Rendah Low Voltage Commercial Tariff	200 kWj pertama First 200 kWh	sen/kWj sen/kWh 47.04
	201 kWj dan ke atas 201 kWh and above	sen/kWj sen/kWh 53.31
<b>Tarif N3 / Tariff N3:</b> Tarif Komersial Voltan Tinggi High Voltage Commercial Tariff	Kehendak Maksimum Bulanan Monthly Maximum Demand	RM/kW 33.73
	Semua kWj All kWh	sen/kWj sen/kWh 37.63
<b>Tarif N4 / Tariff N4:</b> Tarif Industri Voltan Rendah Low Voltage Industrial Tariff	200 kWj pertama First 200 kWh	sen/kWj sen/kWh 41.82
	201 kWj dan ke atas 201 kWh and above	sen/kWj sen/kWh 47.04
<b>Tarif N5 / Tariff N5:</b> Tarif Industri Am Voltan Tinggi High Voltage General Industrial Tariff	Kehendak Maksimum Bulanan Monthly Maximum Demand	RM/kW 31.63
	Semua kWj All kWh	sen/kWj sen/kWh 35.23
<b>Tarif N6 / Tariff N6:</b> Tarif Industri Puncak/Luar Puncak Voltan Tinggi (33/11kV) High Voltage Industrial Peak/Off-Peak Tariff (33/11kV)	Kehendak Maksimum Bulanan Monthly Maximum Demand	RM/kW 40.11
	Semua kWj Puncak All Peak kWh	sen/kWj sen/kWh 34.67
	Semua kWj Luar Puncak All Off-Peak kWh	sen/kWj sen/kWh 21.20
<b>Tarif N8 / Tariff N8:</b> Tarif Perindustrian Puncak/Luar Puncak Voltan Tinggi (132kV) High Voltage Industrial Peak/Off-Peak Tariff (132kV)	Kehendak Maksimum Bulanan Monthly Maximum Demand	RM/kW 40.11
	Semua kWj Puncak All Peak kWh	sen/kWj sen/kWh 34.67
	Semua kWj Luar Puncak All Off-Peak kWh	sen/kWj sen/kWh 21.20

<p><b>Tarif N10 / Tariff N10:</b> Tarif Lampu Jalan Raya Street Lighting Tariff</p>	<p>Semua kWj All kWh</p>	<p>sen/kWj sen/kWh</p>	<p>20.61</p>
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Dari segi prestasi pembekalan elektrik NUR pada 2022, ST turut membuat semakan ke atas ASP NUR bagi tahun tersebut, di mana ASP ialah sekitar 37.58 sen/kWj berbanding tarif asas yang ditetapkan bagi tempoh yang sama iaitu 37.69 sen/kWj.

Oleh itu, sebarang lebihan dalam pelarasan hasil tahunan NUR bagi 2022 akan diselaraskan sebagai pelan mitigasi bagi mengurangkan kadar surcaj tarif yang sepatutnya dikenakan kepada pengguna dan ia juga tertakluk kepada pertimbangan dan kelulusan Kerajaan.

*In terms of NUR's 2022 electricity supply performance, the Commission also reviewed NUR's ASP for that year, which was around 37.58 sen/kWh compared to the average base tariff of the same period at 37.69 sen/kWh.*

*Therefore, surplus in NUR's annual revenue adjustment will be adjusted as a mitigation plan to reduce the surcharge tariff rate that should be imposed on the consumers, subject to the Government's consideration and approval.*

## Pelaksanaan Pelarasan Tarif di Bawah Mekanisme ICPT bagi NUR di KHTP

### *Implementation of Tariff Adjustments Under the ICPT Mechanism for NUR in KHTP*

Mesyuarat Jawatankuasa ICPT telah diadakan sebanyak dua (2) kali setahun, masing-masing pada 13 April 2022 dan 20 September 2022, bagi membincangkan kuantum ICPT yang perlu dilepaskan kepada pengguna NUR dengan mengambil kira cadangan beberapa opsyen. Ahli Jawatankuasa mesyuarat ini terdiri daripada wakil-wakil KeTSA, Kementerian Kewangan, Unit Perancangan Ekonomi, Kementerian Perdagangan Antarabangsa Dan Industri, NUR dan PETRONAS.

*The ICPT Committee meetings were held twice a year, specifically on 13 April 2022 and 20 September 2022, to discuss the ICPT quantum to be released to NUR's consumers, taking into account the proposed options. The committee members comprised the representatives from KeTSA, Ministry of Finance, Economic Planning Unit, Ministry of International Trade and Industry, NUR and PETRONAS.*

### **Semakan Kuantum ICPT di KHTP bagi Tempoh Pelaksanaan Januari Hingga Jun 2022**

Kerajaan pada 22 Disember 2021 telah membuat keputusan dan bersetuju menangguhkan pelaksanaan pelarasan tarif elektrik di bawah mekanisme ICPT di KHTP bagi tempoh 1 Januari 2022 hingga 30 Jun 2022 sehingga ke satu tarikh yang akan ditentukan oleh Kerajaan. Rebat sebanyak 2 sen/ kWj kepada semua pengguna elektrik di KHTP dikekalkan.

### ***Review of ICPT Quantum in KHTP for the Implementation Period of January to Jun 2022***

*On 22 December 2021, the Government decided and agreed to postpone the implementation of electricity tariff adjustments under the ICPT mechanism in KHTP from 1 January 2022 to 30 June 2022, until a date to be determined by the Government. The rebate of 2 sen/kWh was maintained for all electricity consumers in KHTP.*



## Pelaksanaan Pelarasan Tarif di Bawah Mekanisme ICPT di KHTP bagi Tempoh Februari hingga Jun 2022

Pada 26 Januari 2022, KeTSA telah membentangkan semula kertas cadangan dan Kerajaan telah membuat keputusan berikut:

- Tiada perubahan kadar tarif elektrik kepada pengguna domestik.
- Surcaj 3.88 sen/kWj dilepaskan kepada pengguna bukan domestik seperti komersial dan industri.
- Kos pemberian rebat 2.00 sen/kWj kepada pengguna bukan domestik di KHTP bagi Januari 2022 iaitu sebanyak RM2.64 juta dibiayai menggunakan jumlah penjimatan ICPT bagi tempoh Januari 2021 hingga Jun 2021. Baki penjimatan tersebut, sebanyak RM6.58 juta akan dipindahkan kepada dana KWIE.

## Pelaksanaan Pelarasan Tarif di Bawah Mekanisme ICPT di KHTP bagi Tempoh Julai hingga Disember 2022

Kerajaan pada 22 Jun 2022 telah membuat keputusan dan bersetuju supaya pelarasan tarif elektrik di bawah mekanisme ICPT bagi NUR di KHTP sebanyak RM40.33 juta atau bersamaan kadar surcaj 4.95 sen/kWj bagi tempoh 1 Julai 2022 hingga 31 Disember 2022 dilepaskan sepenuhnya kepada pengguna bukan domestik.

## Implementation of Tariff Adjustment Under the ICPT Mechanism in KHTP for the Period of February to June 2022

On 26 January 2022, KeTSA presented a revised proposal, and the Government decided as follows:

- No changes in electricity tariff rates for domestic consumers.
- A surcharge of 3.88 sen/kWh will be imposed on non-domestic consumers such as commercial and industrial.
- The cost of providing a rebate of 2.00 sen/kWh to non-domestic consumers in KHTP for January 2022, amounting to RM2.64 million, to be funded using the ICPT savings from January 2021 to June 2021. The remaining savings of RM6.58 million to be transferred to the EIF fund.

## Implementation of Tariff Adjustment Under the ICPT Mechanism in KHTP for the Period of July to December 2022

On 22 June 2022, the Government decided and agreed that the electricity tariff adjustment under the ICPT mechanism for NUR in KHTP, amounting to RM40.33 million or an equivalent surcharge rate of 4.95 sen/kWh, for the period from 1 July 2022 to 31 December 2022, to be fully released to the non-domestic consumers.

## Pelaksanaan Kadar Tarif Asas Elektrik di Sabah dan Labuan di bawah Mekanisme IBR bagi Tempoh Kawal Selia Pertama (RP1: 2022 – 2024)

### Implementation of the Electricity Base Tariff Rate in Sabah and Labuan Under the IBR Mechanism for the First Regulatory Period (RP1: 2022 – 2024)

Di Sabah dan Labuan, pelaksanaan IBR bermula dengan tempoh percubaan pada September 2020 sehingga 31 Disember 2021, sebelum dilaksanakan secara penuh untuk tempoh RP1 yang bermula 1 Januari 2022 hingga 31 Disember 2024.

In Sabah and Labuan, the implementation of IBR began with a trial period from September 2020 until 31 December 2021, before being fully implemented for the RP1 period starting from 1 January 2022 until 31 December 2024.

Dalam tempoh percubaan dan RP1, tarif asas elektrik yang ditetapkan adalah pada 34.52 sen/kWj sepertimana kadar tarif yang sama sejak 2014. Pengekalan kadar tarif ini dinikmati oleh lebih 600,000 pengguna domestik dan bukan domestik termasuk komersial dan industri. Dari 2005 sehingga 2022, Kerajaan telah membelanjakan subsidi sebanyak RM9.64 billion bagi menampung kos pengoperasian Sabah Electricity Sdn. Bhd. (SESB), di samping mengekalkan kadar tarif sedia ada.

Melalui pelaksanaan mekanisme IBR di Sabah dan Labuan, prestasi pengoperasian SESB dapat dikawal selia dan dipantau dengan lebih efektif, pada asas-asas seperti berikut:

- Semakan tarif dibuat pada setiap tempoh kawal selia [tiga (3) tahun] dengan pelarasan bagi perubahan kos bahan api yang di luar kawalan utiliti secara teratur.
- Pengasingan akaun bagi setiap entiti perniagaan utiliti yang dikawal selia supaya meningkatkan kecekapan kos iaitu tiada pertindihan kos operasi dan kos modal.
- Penilaian operasi SESB dilaksanakan berdasarkan penetapan petunjuk prestasi utama (KPI) iaitu diberikan insentif sekiranya prestasi baik dan dikenakan penalti sekiranya tidak mencapai sasaran yang ditetapkan.

Bagi memastikan pelaksanaan mekanisme IBR seiring dengan situasi semasa dan amalan terbaik di negara-negara lain, ST telah meluluskan penambahbaikan garis panduan penetapan tarif di bawah mekanisme IBR iaitu *Guidelines on Electricity Tariff Determination Under Incentive Based Regulation (IBR) For Sabah and Federal Territory of Labuan 2022* untuk diaplikasikan dalam RP1 dan tempoh berikutnya.

Berdasarkan kepada prestasi pembekalan elektrik untuk 2022, kadar permintaan telah direkodkan menurun sebanyak 0.7% iaitu 5,735 GWj berbanding unjuran yang ditetapkan di bawah mekanisme IBR iaitu 5,775 GWj. Namun, kos penjanaan oleh SESB telah meningkat sebanyak 34.60 sen/kWj berbanding 27.94 sen/kWj yang diunjurkan berikutan harga bahan api yang meningkat di peringkat global serta penambahan penggunaan bahan api berasaskan diesel dan *medium fuel oil* (MFO).

*During the trial period and RP1, the base tariff was set at 34.52 sen/kWh, maintaining the same tariff rate since 2014. This tariff rate retention has benefited over 600,000 domestic and non-domestic consumers, including commercial and industrial consumers. From 2005 to 2022, the Government provided subsidies totalling RM9.64 billion to support the operational costs of Sabah Electricity Sdn. Bhd. (SESB) while maintaining the existing tariff rates.*

*Through the implementation of the IBR mechanism in Sabah and Labuan, the operational performance of SESB can be effectively supervised and monitored based on the following principles:*

- *Tariff to be reviewed for each regulatory period (three (3) years), with adjustments for fuel cost changes beyond the utility's control on a regular basis.*
- *Separation of accounts for each utility business entity to enhance cost efficiency, eliminating overlap in operational and capital costs.*
- *Performance evaluation of SESB operations is carried out based on the establishment of key performance indicators (KPIs), providing incentives for good performance and imposing penalties for not meeting set targets.*

*To ensure the implementation of the IBR mechanism aligns with the current situation and best practices in other countries, the Commission has approved the enhancement of guidelines for tariff determination under the IBR mechanism, namely the *Guidelines on Electricity Tariff Determination Under Incentive Based Regulation (IBR) for Sabah and Federal Territory of Labuan 2022*, to be applied in the RP1 and subsequent periods.*

*Based on the electricity supply performance for 2022, a decrease in demand was recorded, amounting to 0.7%, which was 5,735 GWh compared to the projected demand under the IBR mechanism of 5,775 GWh. However, the generation cost by SESB has increased to 34.60 sen/kWh compared to the projected cost of 27.94 sen/kWh, due to the global increase in fuel prices and the additional use of diesel and medium fuel oil (MFO) as fuel sources.*

Selain itu, ASP untuk 2022 menurun kepada 34.34 sen/kWj berbanding unjuran iaitu 34.52 sen/kWj. Antara faktor penyumbang penurunan ini adalah trend penggunaan tenaga elektrik yang meningkat semasa tempoh luar puncak dan hujung minggu yang menawarkan kadar tarif lebih rendah, terutamanya bagi pengguna bukan domestik seperti komersial dan industri.

*In addition, the ASP for 2022 decreased to 34.34 sen/kWh compared to the projected ASP of 34.52 sen/kWh. One of the contributing factors to the decrease is the increase in off-peak tariff rider and Sunday tariff rider, which offer lower tariff rates especially for non-domestic users such as commercial and industrial sectors.*

## Pelaksanaan Pelarasan Tarif di Bawah Mekanisme ICPT bagi SESB di Sabah dan Labuan

### *Implementation of Tariff Adjustments Under the ICPT Mechanism for SESB in Sabah and Labuan*

Selaras dengan pelaksanaan IBR, mekanisme ICPT turut digunakan bagi pelarasan tarif elektrik untuk tempoh setiap enam (6) bulan yang mengambil kira perubahan pada kos penjanaan dan pembekalan oleh SESB. Situasi kos pembekalan elektrik di Sabah dan Labuan adalah sedikit berbeza berbanding di Semenanjung dan KHTP, di mana sebahagian daripada kos pembekalan tersebut ditampung melalui subsidi oleh Kerajaan. Justeru itu, mekanisme ICPT ini akan membuat imbangan dan pelarasan terhadap subsidi yang telah diperuntukkan kepada SESB terlebih dahulu sebelum dilepaskan kepada pengguna atau apa jua keputusan oleh Kerajaan kelak.

Sepertimana pelaksanaan ICPT di Semenanjung, kadar tarif elektrik asas di Sabah dan Labuan bagi tempoh IBR RP1 ditentukan dengan menetapkan andaian harga penanda aras bahan api diesel, MFO, gas dan lain-lain parameter berkaitan kos penjanaan dalam tempoh tersebut.

Sebarang perbezaan harga sebenar dengan harga penanda aras bahan api dalam penetapan tarif asas akan diselaraskan setiap enam (6) bulan di bawah mekanisme ICPT, sama ada dalam bentuk surcaj atau rebat dan ia bergantung kepada semakan ke atas kos bahan api dan kos penjanaan lain dalam tempoh tersebut.

*In line with the implementation of IBR, the ICPT mechanism is also used for electricity tariff adjustments every six (6) months, taking into account changes in generation and supply costs by SESB. The electricity supply cost situation in Sabah and Labuan is slightly different compared to the Peninsula and KHTP, where a portion of the supply costs is subsidised by the Government. Therefore, the ICPT mechanism will balance and adjust the subsidies allocated to SESB before releasing them to consumers or any decisions by the Government in the future.*

*Similar to the implementation of ICPT in the Peninsula, the base electricity tariff rates in Sabah and Labuan for the IBR RP1 are determined by establishing benchmark fuel prices for diesel, MFO, gas, and other relevant parameters for generation costs during that period.*

*Any difference between the actual fuel prices and the benchmark fuel prices in the determination of the base tariff will be adjusted every six (6) months under the ICPT mechanism, either in the form of surcharges or rebates, depending on the review of fuel and other generation costs during that period.*

## Semakan Kuantum ICPT di Sabah dan Labuan bagi Tempoh Pelaksanaan Januari hingga Jun 2022

Memandangkan mekanisme ICPT di Sabah dan Labuan adalah pertama kali dilaksanakan secara penuh bermula 1 Januari 2022, maka tiada pelarasan ICPT yang dilakukan untuk tempoh 1 Januari 2022 hingga Jun 2022.

## Semakan Kuantum ICPT di Sabah dan Labuan bagi Tempoh Pelaksanaan Julai hingga Disember 2022

Bagi tempoh semakan ICPT 1 Januari 2022 hingga 30 Jun 2022, terdapat anggaran penjimatan kos tidak berimbang sebanyak RM6.96 juta atau bersamaan rebat pada kadar 0.25 sen/kWj. Ini disebabkan oleh penurunan unit jualan dan sebahagian besarnya disumbangkan daripada pengurangan kos bayaran kapasiti diikuti *renewable energy displaced cost* dan *variable operating cost*.

## Pelaksanaan Pelarasan Tarif di bawah Mekanisme ICPT di Sabah dan Labuan bagi Tempoh Julai hingga Disember 2022

Kerajaan pada 29 Jun 2022 memutuskan seperti berikut:

- Anggaran penjimatan kos tidak berimbang di bawah mekanisme ICPT bagi tempoh 1 Januari 2022 hingga 30 Jun 2022 di Sabah dan Labuan sebanyak RM6.96 juta atau bersamaan rebat pada kadar 0.25 sen/kWj.
- Tiada pelarasan ICPT dalam bentuk rebat dilaksanakan untuk tempoh 1 Julai 2022 hingga 31 Disember 2022, walaupun terdapat penjimatan kos subsidi. Pelarasan sebenar ICPT bagi tempoh Januari 2022 hingga Jun 2022 akan disemak semula dalam tempoh kitaran ICPT Julai 2022 hingga Disember 2022 dan dilaksanakan bermula Januari 2023.
- Penjimatan peruntukan subsidi dalam tempoh RP1 digunakan untuk menampung sebarang kos ICPT sekiranya terdapat keperluan subsidi tambahan bagi tempoh RP1.

## Review of ICPT Quantum in Sabah and Labuan for the Implementation Period of January to June 2022

*Since the full implementation of the ICPT mechanism in Sabah and Labuan started on 1 January 2022, no ICPT adjustments were made for the period of 1 January 2022 to June 2022.*

## Review of ICPT Quantum in Sabah and Labuan for the Implementation Period of July to December 2022

*For the ICPT review period from 1 January 2022 to 30 June 2022, there is an estimated imbalance cost savings of RM6.96 million or an equivalent rebate of 0.25 sen/kWh. This is due to the decrease in sales units, with a significant portion contributed from the reduction in capacity payment costs, followed by renewable energy displaced cost and variable operating costs.*

## Implementation of Tariff Adjustment Under the ICPT Mechanism in Sabah and Labuan for the Period of July to December 2022

*On 29 June 2022, the Government decided as follows:*

- *An estimated imbalance cost savings under the ICPT mechanism for the period from 1 January 2022 to 30 June 2022 in Sabah and Labuan is RM6.96 million or equivalent to a rebate rate of 0.25 sen/kWh.*
- *No ICPT rebate adjustments to be implemented for the period of 1 July 2022 to 31 December 2022, despite subsidy cost savings. The actual ICPT adjustment for the January 2022 to June 2022 period will be reviewed during the ICPT cycle from July 2022 to December 2022 and implemented starting from January 2023.*
- *The subsidy allocation savings during the RP1 period will be utilised to cover any additional ICPT costs if there is a need for additional subsidies during the RP1 period.*



# Pengauditan Pematuhan Terhadap Bayaran ICPT oleh ST dan KWIE

## *Compliance Audit of ICPT Payment by the Commission and EIF*

Pihak Jabatan Audit Negara (JAN) telah menjalankan proses pengauditan pematuhan terhadap bayaran ICPT oleh ST dan KWIE bermula pada 17 Mac 2022 yang diadakan selama tiga (3) bulan. Objektif pengauditan ini adalah untuk menentukan sama ada bayaran ICPT oleh KWIE dilaksanakan dengan mematuhi undang-undang dan peraturan kewangan yang berkuatkuasa.

Berdasarkan maklumat pihak JAN, ia adalah selaras dengan pelaksanaan pengauditan pematuhan terhadap Kementerian/Jabatan/Agensi Persekutuan dan Negeri bermula 2019 dengan mandat pengauditan yang telah diberikan seperti berikut:

- Perkara 106 Perlembagaan Persekutuan
- Akta Audit 1957 [Akta 62]
- Akta Badan Berkanun (Akaun Dan Laporan Tahunan) 1980 [Akta 240]
- Akta Suruhanjaya Tenaga 2001 [Akta 610]

Antara skop pengauditan ini adalah merujuk kepada rekod dan data yang dikendalikan oleh ST dan KWIE berkaitan semakan ICPT dari tahun 2020 sehingga terkini. Metodologi yang diguna pakai oleh pihak JAN pula meliputi semakan dokumen serta rekod ICPT, analisis maklumat, lawatan fizikal, pembentangan dan juga temu bual dengan ST dan KWIE. Hasil pengauditan mendapati bahawa mekanisme ICPT telah diurus mengikut prosedur serta peraturan ST dan KWIE yang berkuatkuasa, dan keputusan ini telah dimaklumkan secara rasmi kepada ST pada 12 September 2022.

*The National Audit Department (JAN) conducted a compliance audit process on ICPT payments by the Commission and EIF, starting from 17 March 2022, which were held for three (3) months. The objective of this audit is to determine whether the ICPT payments by EIF were implemented in compliance with the applicable laws and financial regulations.*

*According to JAN, this audit is aligned with the implementation of compliance audits on Federal and State Ministries/Departments/Agencies since 2019, with the given audit mandate as follows:*

- Article 106 of the Federal Constitution
- Audit Act 1957 [Act 62]
- Statutory Bodies (Accounts and Annual Reports) Act 1980 [Act 240]
- Energy Commission Act 2001 [Act 610]

*Among the scope of the audit are record and data managed by the Commission and KWIE related to ICPT review from 2020 until present. The methodology used by JAN includes ICPT document and record review, information analysis, physical visits, presentations and interviews with the Commission and KWIE. The audit findings concluded that the ICPT mechanism was managed in accordance with the effective procedures and regulations, and the result was officially notified to the Commission on 12 September 2022.*

# Liberalisasi Industri Pembekalan Gas Asli

## *Liberalisation of the Natural Gas Supply Industry*

### **Pelaksanaan Penetapan Tarif bagi Penggunaan Kemudahan Gas Milik Regas Terminal Sg. Udang Sdn. Bhd. (RGTSU), Pengerang LNG (Two) Sdn. Bhd. (RGTP), PETRONAS Gas Berhad (PGB) dan Gas Malaysia Distribution Sdn. Bhd. (GMD) untuk RP1 di bawah IBR**

Pelaksanaan penetapan tarif bagi penggunaan kemudahan gas di bawah mekanisme IBR telah dilaksanakan seperti berikut:

- Penetapan purata tarif asas untuk RP1 yang berkuat kuasa 1 Januari 2020 sehingga 31 Disember 2022 bagi penggunaan kemudahan gas seperti terminal penggasan semula, talian paip penghantaran dan talian paip pengagihan oleh pihak ketiga.
- Pelarasan pendapatan tahunan iaitu semakan semula purata tarif yang dibenarkan yang dilaksanakan pada setiap tahun tempoh kawal selia, yang mana sekiranya terdapat perbezaan di antara pendapatan tahunan yang dibenarkan dan pendapatan tahunan sebenar.

Penetapan purata tarif asas bagi penggunaan kemudahan gas untuk RP1 di bawah mekanisme IBR mula berkuat kuasa pada 1 Januari 2020 dan akan berakhir pada 31 Disember 2022.

### ***Implementation of Tariff Determination for the Utilisation of Gas Facilities Owned by Regas Terminal Sg. Udang Sdn. Bhd. (RGTSU), Pengerang LNG (Two) Sdn. Bhd. (RGTP), PETRONAS Gas Berhad (PGB), and Gas Malaysia Distribution Sdn. Bhd. (GMD) for RP1 Under IBR***

*The implementation of tariff determination for the utilisation of gas facilities under the IBR mechanism has been carried out as follows:*

- *Determination of average base tariff for RP1, effective from 1 January 2020 until 31 December 2022, for the utilisation of gas facilities such as regasification terminals, transmission pipelines and distribution pipelines by third parties.*
- *Annual revenue adjustments, which involve a review of the allowed average tariff, implemented in each year of the regulatory period, which if there are differences between the allowed annual revenue and the actual annual revenue.*

*The average base tariff determination for the utilisation of gas facilities for RP1 under the IBR mechanism took effect on 1 January 2020, and expired on 31 December 2022.*

### **Purata Tarif Asas bagi Penggunaan Kemudahan Gas untuk RP1**

#### *Average Base Tariffs for the Utilisation of Gas Facilities for RP1*

<b>Pemegang Lesen</b> <i>Licensees</i>	<b>Jenis Kemudahan Gas</b> <i>Type of Gas Facility</i>	<b>Purata Tarif Asas (RM/GJ/hari)</b> <i>Average Base Tariff (RM/GJ/day)</i>
<b>RGTSU</b>	Terminal Penggasan Semula <i>Regasification Terminal</i>	3.455
<b>RGTP</b>	Terminal Penggasan Semula <i>Regasification Terminal</i>	3.485
<b>PGB</b>	Talian Paip Penghantaran <i>Transmission Pipeline</i>	1.129
<b>GMD</b>	Talian Paip Pengagihan <i>Distribution Pipeline</i>	1.573

Pelarasan purata tarif yang dibenarkan bagi penggunaan kemudahan gas milik RGTSU, RGTP, PGB dan GMD untuk 2022 telah dilaksanakan melalui mekanisme pelarasan pendapatan tahunan. Mekanisme ini bertujuan untuk menyelaraskan perbezaan antara pendapatan tahunan yang diunjurkan dan pendapatan sebenar yang diperoleh pemegang lesen. Pelarasan pendapatan tahunan untuk RP1 melibatkan pelarasan bagi komponen-komponen seperti berikut:

- Revenue Cap
- Excluded Services
- Tariff Cap
- Internal Gas Consumption (IGC)

*The allowed average tariff adjustments for the utilisation of gas facilities owned by RGTSU, RGTP, PGB, and GMD for 2022 have been implemented through the annual revenue adjustment mechanism. This mechanism aims to reconcile the difference between the forecasted annual revenue and the actual revenue obtained by the licensees. The annual revenue adjustment for RP1 involves adjustments for the following components:*

- Revenue Cap
- Excluded Services
- Tariff Cap
- Internal Gas Consumption (IGC)

**Pelarasan Pendapatan Tahunan dan Purata Tarif yang Dibenarkan, 2022**  
*Annual Revenue Adjustments and Allowed Average Tariffs, 2022*

<b>Pemegang Lesen</b> <i>Licensees</i>	<b>Purata Tarif Asas RP1</b> <b>(RM/GJ/hari)</b> <i>Average Base Tariff for RP1 (RM/GJ/day)</i>	<b>Pelarasan Pendapatan Tahunan (RM/GJ/hari)</b> <i>Annual Revenue Adjustment (RM/GJ/day)</i>	<b>Purata Tarif Yang Dibenarkan (RM/GJ/hari)</b> <i>Allowed Average Tariff (RM/GJ/day)</i>
<b>RGTSU</b>	3.455	0.000	3.455
<b>RGTP</b>	3.485	0.000	3.485
<b>PGB</b>	1.129	-0.001	1.128
<b>GMD</b>	1.573	+0.163	1.715*

\*Nota: Kerajaan memutuskan agar purata tarif yang dibenarkan bagi GMD dikekalkan seperti tempoh 1 April 2021 hingga 31 Disember 2021 iaitu pada kadar RM1.715/GJ/hari. Pelarasan pendapatan tahunan sebanyak RM0.163/GJ/hari telah ditampung melalui lebihan kutipan Gas Cost Pass-Through (GCPT).

\*Note: The Government has decided to maintain the allowed average tariff for GMD same as the period from 1 April 2021 to 31 December 2021, which is RM1.715/GJ/day. The annual revenue adjustment of RM0.163/GJ/day has been accommodated through the Gas Cost Pass-Through (GCPT) over-recovery.

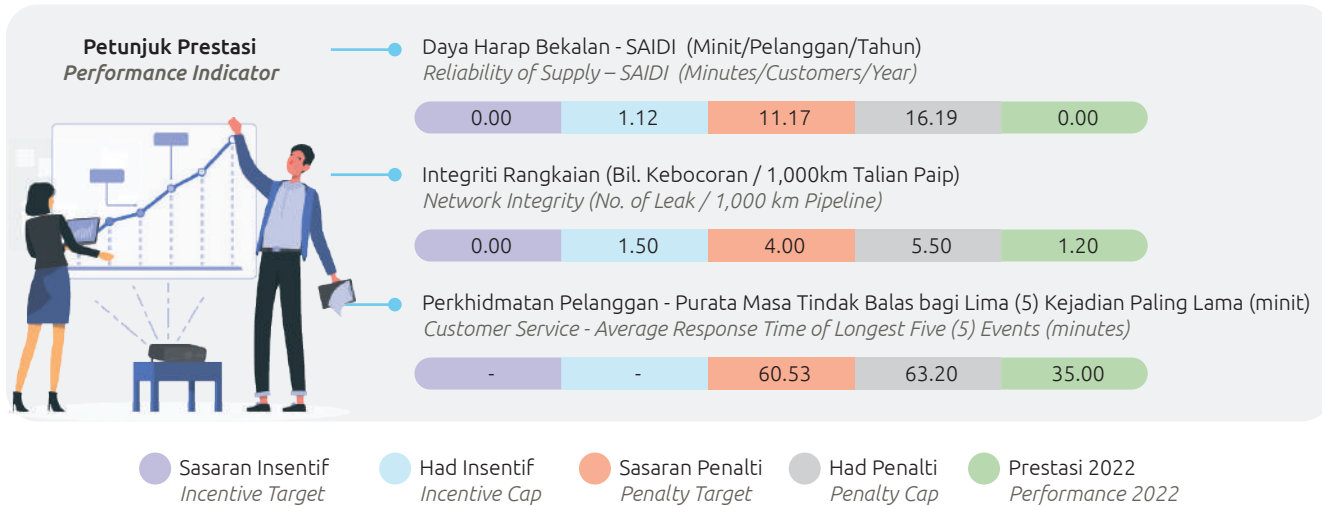
Di bawah mekanisme IBR juga, pemantauan ke atas prestasi pemegang lesen kemudahan gas terus dilaksanakan berdasarkan petunjuk-petunjuk prestasi yang telah ditetapkan. Bagaimanapun, tiada pemberian insentif atau penalti untuk RP1 memandangkan tempoh tersebut merupakan tempoh bagi menambah baik dan mengenal pasti kesesuaian penunjuk prestasi sebelum dilaksanakan sepenuhnya dalam RP2.

*Under the IBR mechanism, monitoring of the performance of gas facility licensees continues to be carried out based on the established performance indicators. However, no incentives or penalties are given for RP1 as this period is meant for improving and identifying the suitability of performance indicators before full implementation in RP2.*

**Prestasi RGTSU, RGTP dan PGB, 2022**  
*Performance of RGTSU, RGTP and PGB, 2022*

Pemegang Lesen <i>Licensees</i>	Petunjuk Prestasi <i>Performance Indicator</i>	Sasaran Penalti (%) <i>Penalty Target (%)</i>	Had Penalti (%) <i>Penalty Cap (%)</i>	Prestasi 2022 (%) <i>Performance 2022 (%)</i>
RGTSU	Ketersediaan <i>Availability</i>	90.00	78.72	92.80
	Daya Harap <i>Reliability</i>	98.00	86.43	99.98
RGTP	Ketersediaan <i>Availability</i>	90.00	89.88	99.97
	Daya Harap <i>Reliability</i>	98.00	97.88	99.98
PGB	Ketersediaan <i>Availability</i>	99.00	98.89	99.93
	Daya Harap <i>Reliability</i>	99.00	98.91	99.95

**Prestasi GMD, 2022**  
*GMD Performance, 2022*



## Pengurusan dan Kemampanan Kumpulan Wang Industri Elektrik (KWIE)

### *Management and Sustainability of the Electricity Industry Fund (EIF)*

KWIE ditubuhkan pada 1 Januari 2016 berdasarkan peruntukan di bawah Akta Bekalan Elektrik (ABE) 1990, dengan tujuan utama bagi menguruskan impak tarif elektrik kepada pengguna. KWIE ditadbir urus sepenuhnya oleh ST, berdasarkan amalan kewangan yang baik dan bagi memastikan sumber dana KWIE kekal mampan.

*EIF was established on 1 January 2016 under the Electricity Supply Act (ABE) 1990, with the main objective to manage the impact of electricity tariffs on consumers. EIF is fully administered by the Commission, based on financial best practices and to ensure the sustainability of EIF.*



Berbanding tahun-tahun sebelumnya, pada 2022, KWIE tidak menerima sebarang pindahan dana melalui pelarasan hasil dan kos di bawah IBR. Ia selaras dengan keputusan Kerajaan agar segala penjimatan ICPT di bawah IBR digunakan secara langsung untuk mengurangkan impak tarif elektrik kepada pengguna. Justeru itu, pendapatan KWIE pada 2022 hanya daripada pendapatan faedah ke atas simpanan dana.

Pendapatan faedah yang diperoleh KWIE terdiri daripada keuntungan bagi penempatan dana KWIE di dalam Simpanan Tetap (FD), *Short-Term Money Market Deposit* (STMMD) dan hibah Akaun Semasa (CA) KWIE di institusi kewangan yang berdaftar di bawah Kementerian Kewangan. Setiap agihan dan penempatan dana di institusi kewangan dibuat berdasarkan Polisi Dana KWIE, serta bergantung kepada tawaran kadar pulangan yang tinggi dan kompetitif.

## Pelaburan Dana KWIE

Sepanjang 2022, BNM telah menaikkan *Overnight Policy Rate* (OPR) sebanyak empat (4) kali, berjumlah 1.00%. Kadar OPR pada awal 2022 adalah sebanyak 1.75% dan meningkat kepada 2.75% hujung 2022.

Secara purata, jumlah pendapatan faedah FD dan STMMD yang diperolehi oleh KWIE pada 2022 meningkat sebanyak 25% berbanding 2021.

*Compared to previous years, in 2022, EIF does not receive any fund transfers from revenue and cost adjustments under IBR. It is consistent with the Government's decision that all ICT savings under IBR is directly used to reduce the impact of electricity tariffs on consumers. Therefore, EIF's income in 2022 is solely from interest received from placement.*

*EIF's interest income is derived from the returns on placement in Fixed Deposits (FD), Short-Term Money Market Deposits (STMMD), and Current Account (CA) at financial institutions registered under the Ministry of Finance. Each fund distribution and placement in such financial institutions is governed by EIF's Fund Policy, as well as depending on high and competitive return offers.*

## Investment of EIF Funds

*Throughout 2022, BNM increased the Overnight Policy Rate (OPR) four times, totalling 1.00%. The OPR rate at the beginning of 2022 was 1.75% and increased to 2.75% by the end of 2022.*

*On average, EIF's interest income from FD and STMMD in 2022 increased by 25% compared to 2021.*

## Sorotan Utama

### Main Highlights

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#### ASEAN Forum on Coal (AFOC)

ASEAN Forum on Coal (AFOC) ditubuhkan sebagai platform kerjasama serantau bagi aktiviti-aktiviti pembangunan dan promosi penggunaan arang batu yang mesra alam serta dalam meningkatkan perdagangan intra-ASEAN bagi bahan api tersebut. Malaysia diberi penghormatan untuk mempengerusikan AFOC sejak 2019 dan dilanjutkan sehingga 2025, dengan pimpinan Ketua Pegawai Eksekutif ST selaku Pengerusi AFOC sepanjang tempoh tersebut.

#### ASEAN Forum on Coal (AFOC)

*The ASEAN Forum on Coal (AFOC) was established as a regional cooperation platform for sustainable coal development and promotion of environmentally friendly coal utilisation, as well as to enhance intra-ASEAN trade in coal. Malaysia has been honoured to chair AFOC since 2019, and the chairmanship has been extended until 2025, with the Commission's CEO leading as the Chairman of AFOC throughout this period.*

AFOC melalui kerjasama *ASEAN Center for Energy (ACE)* telah menjalankan pelbagai aktiviti sepanjang 2022 yang merangkumi promosi penggunaan *clean coal technology (CCT)*, *outreach programmes* dan webinar untuk pembangunan kapasiti dan kompetensi negara anggota ASEAN.

Selain itu, Malaysia menjadi tuan rumah bagi *High-Level Policy Dialogue on Coal: Role of Coal and Clean Coal Technology (CCT) and Carbon Capture Utilisation and Storage (CCUS) in Sustainable Energy Future* pada 10 Ogos 2022. Sesi dialog ini menjadi platform kepada pemegang taruh untuk bertukar pendapat dalam memacu penggunaan teknologi CCT dan CCUS di ASEAN. Antara intipati penting yang telah dibincangkan semasa sesi dialog ini adalah:

- Keperluan menambah baik mekanisme perdagangan arang batu serantau yang telus bagi meningkatkan daya tahan dan sekuriti bekalan ASEAN.
- Komitmen untuk mempertingkatkan penggunaan teknologi CCT & CCUS termasuk penyediaan polisi dan rangka kerja kawal selia yang berkaitan serta pemindahan teknologi melalui kerjasama antarabangsa.
- Potensi kerjasama merentasi sektor bagi amalan terbaik berkenaan polisi dan insentif rendah karbon serta mekanisme perdagangan karbon.
- Pembangunan *ASEAN Taxonomy for Sustainable Finance* yang merupakan blok binaan penting bagi membolehkan peralihan dan memupuk penggunaan kewangan mampan oleh negara anggota ASEAN.

*AFOC, in collaboration with the ASEAN Center for Energy (ACE), conducted various activities throughout 2022, including the promotion of clean coal technology (CCT), outreach programmes, and webinars to enhance the capacity and competency of ASEAN member countries.*

*Furthermore, Malaysia hosted the High-Level Policy Dialogue on Coal: Role of Coal and Clean Coal Technology (CCT) and Carbon Capture Utilisation and Storage (CCUS) in Sustainable Energy Future on 10 August 2022. This dialogue session served as a platform for stakeholders to exchange views on promoting the use of CCT and CCUS technologies in ASEAN. Some important highlights discussed during the dialogue session were:*

- *The need to enhance transparent regional coal trade mechanisms to improve resilience and energy supply security in ASEAN.*
- *Commitment to intensify the utilisation of CCT & CCUS technologies, including the development of relevant policies and regulatory frameworks as well as technology transfer through international cooperation.*
- *Potential cross-sectoral cooperation on best practices regarding low-carbon policies, incentives, and carbon trading mechanisms.*
- *The development of the ASEAN Taxonomy for Sustainable Finance, which serves as a crucial building block to facilitate the transition and foster the use of sustainable finance among ASEAN member countries.*



**Penganjuran ASEAN High-Level Policy Dialogue (HLPD) on Coal**  
*Organisation of ASEAN High-Level Policy Dialogue (HLPD) on Coal*

Malaysia juga dijemput untuk mewakili AFOC sebagai ahli panel dalam webinar bertajuk “The Security of the Natural Gas and Coal: How ASEAN Should Face Future Challenges?” Webinar ini dianjurkan bersempena pelancaran 7<sup>th</sup> ASEAN Energy Outlook. Antara topik utama yang dibincangkan adalah peranan arang batu dalam memastikan sekuriti bekalan tenaga ASEAN seterusnya memacu sasaran ASEAN untuk menjadi ekonomi rendah karbon menjelang 2050.

### Tahun Pertama Pelaksanaan Program Tarif Elektrik Hijau (GET) di Semenanjung

Tarif Elektrik Hijau (GET) adalah pembelian tenaga elektrik dari sumber TBB yang digabungkan dengan *Malaysia Renewable Energy Certificate* (mREC). Ia merupakan satu inisiatif yang menawarkan bekalan elektrik daripada sumber TBB kepada pengguna TNB yang berhasrat untuk mengurangkan jejak karbon dan memenuhi sasaran *Environmental, Social and Governance* (ESG) syarikat masing-masing.

Permohonan kuota GET dibuka pada 1 Disember 2021 dengan jumlah langganan yang ditawarkan bagi 2022 sebanyak 4,000 GWj. Bermula 1 Januari 2022, pengguna yang melanggan GET dibekalkan dengan bekalan elektrik TBB dari stesen jana kuasa LSS dan hidro yang sedang beroperasi. ST telah mengeluarkan satu Garis Panduan GET sebagai rujukan pelaksanaan program ini.

Hasil kerjasama semua pihak dalam mempromosikan program ini, GET mendapat sambutan yang amat memberangsangkan di mana kesemua kuota yang ditawarkan telah dilanggan sepenuhnya pada April 2022 oleh 2,035 pengguna TNB.

*Malaysia was also invited to represent AFOC as a panel member in a webinar titled “The Security of Natural Gas and Coal: How ASEAN Should Face Future Challenges?” The webinar was organised in conjunction with the launch of the 7<sup>th</sup> ASEAN Energy Outlook. Among the main topics discussed were the role of coal in ensuring energy supply security in ASEAN and driving ASEAN’s goal of becoming a low-carbon economy by 2050.*

### The First Year of Implementation of the Green Electricity Tariff (GET) Programme in The Peninsula

*The Green Electricity Tariff (GET) is the purchase of electricity from RE sources combined with the Malaysia Renewable Energy Certificate (mREC). It is an initiative that offers electricity supply from RE sources to TNB consumers who are committed to reducing their carbon footprint and meeting their respective Environmental, Social and Governance (ESG) targets.*

*The application for GET quotas opened on 1 December 2021, with a total subscription offered for 2022 of 4,000 GWh. Starting from 1 January 2022, consumers who subscribe to GET are supplied with RE electricity supply from operating LSS and hydro power plants. The Commission has issued a GET Guidelines as a reference for the implementation of this programme.*

*With co-operation of all parties in promoting this programme, GET has received an overwhelming response, with all the quotas offered being fully subscribed by April 2022, involving 2,035 TNB consumers.*

#### Pecahan Langganan Tarif Elektrik Hijau Breakdown of Green Electricity Tariff Subscriptions

60.7%

Pengguna Industri  
Industrial Consumers

39.2%

Pengguna Komersial  
Commercial Consumers

<1%

Pengguna Domestik  
Domestic Consumers



4,000 GWj  
GWh

Berdasarkan rekod, penggunaan sebenar GET sehingga 31 Disember 2022 adalah berjumlah 2,538 GWj dengan 61.6% oleh pengguna industri, 38.4% oleh pengguna komersial dan 0.03% oleh pengguna domestik.

### **Sistem Kewangan KWIE Memudahkan Pengurusan Kewangan**

Susulan pembangunan sistem kewangan KWIE yang bermula pada 20 September 2021, sesi *User Acceptance Test* (UAT) telah dilaksanakan untuk ujian bagi setiap modul yang terlibat termasuklah dari segi proses, laporan, format dokumen dan tetapan sistem.

Pada 21 Mac 2022, sistem kewangan KWIE telah mula beroperasi dengan pelaksanaan transaksi kewangan sepanjang 2022. Sesi Pengujian Penerimaan Akhir (FAT) pula telah dilaksanakan secara berperingkat, melibatkan 12 Sub-Modul Kewangan, Modul Hasil dan *Dashboard*. Pengujian FAT ini mengambil kira modul-modul dibangunkan mengikut spesifikasi yang ditetapkan dan berfungsi sewajarnya.

Susulan itu, pada 9 Disember 2022, FAT telah diluluskan oleh ST dengan harapan agar sistem kewangan KWIE dapat memudah dan menambah baik keberkesanan pengurusan kewangan KWIE serta dapat mengurangkan perekodan maklumat secara manual, sekaligus mengelakkan kesilapan merekod maklumat dan data kewangan KWIE.

*Based on records, the actual usage of GET until 31 December 2022 amounted to 2,538 GWh, with 61.6% utilised by industrial consumers, 38.4% by commercial consumers, and 0.03% by domestic consumers.*

### **EIF Financial System Facilitates Financial Management**

*Following the development of the EIF financial system which began on 20 September 2021, User Acceptance Test (UAT) sessions were conducted to test each module involved, including processes, reports, document formats and system settings.*

*The EIF financial system started on 21 March 2022, with financial transactions throughout 2022. The Final Acceptance Test (FAT) was carried out in stages, involving 12 Financial Sub-Modules, the Revenue Module and the Dashboard. The FAT testing takes into account the modules developed according to specifications and functions accordingly.*

*Subsequently, on 9 December 2022, the FAT was approved by the Commission, with the expectation that the EIF financial system would streamline and enhance the effectiveness of EIF's financial management, reduce manual record-keeping, and minimise errors in recording EIF's financial information and data.*



# 5. MEMPROMOSIKAN KEMAMPAHAN TENAGA

## *PROMOTING ENERGY SUSTAINABILITY*

- 155 **PERKEMBANGAN TENAGA BOLEH BAHARU (TBB)**  
*DEVELOPMENT OF RENEWABLE ENERGY (RE)*
- 156 **PROGRAM PEMETERAN TENAGA BERSIH (NEM) 3.0**  
*NET ENERGY METERING (NEM) 3.0 PROGRAMME*
- 157 **KECEKAPAN TENAGA**  
*ENERGY EFFICIENCY*
- 169 **SOROTAN UTAMA**  
*MAIN HIGHLIGHTS*



## Perkembangan Tenaga Boleh Baharu (TBB)

### Development of Renewable Energy (RE)

Pelaksanaan Program Bidaan Loji Solar Fotovoltaik Berskala Besar dilaksanakan berdasarkan kelulusan oleh Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif (JPPPET), tertakluk di bawah Akta Bekalan Elektrik 1990, peraturan-peraturan dan kod-kod yang berkaitan.

Pelaksanaan adalah difokuskan untuk memastikan daya harap pembekalan elektrik terjamin pada harga yang kompetitif.

Program ini dilaksanakan secara berperingkat bagi mengawal kemasukan sumber penjanaan elektrik serta implikasi kepada tarif.

*The Large-Scale Photovoltaic Solar Plant Bid Programme was implemented based on approval by the Planning and Implementation Committee for Electric Supply and Tariff (JPPPET), subject to the Electricity Supply Act 1990, and relevant regulations and codes.*

*The implementation was focused on ensuring reliable electricity supply at competitive prices.*

*This programme was implemented in stages to control the entry of electric generation sources and its implications on tariffs.*

### Pembidaan LSS yang Telah Dilaksanakan, 2017-2022

#### Completed LSS Bidding, 2017-2022

Kitaran Bidaan Bidding Cycle	Jumlah Kapasiti Bidaan Total Bidding Cycle	Jumlah Kapasiti Yang Telah Beroperasi Total Operational Capacity	Tarikh Scheduled Commercial Operation Date (SCOD) Scheduled Commercial Operation Date (SCOD)
LSS1	Semenanjung The Peninsula 354.00 MW	Semenanjung The Peninsula 354.00 MW	2017-2020
	Sabah dan Labuan Sabah and Labuan 16.90 MW	Sabah dan Labuan Sabah and Labuan 0.00 MW	
LSS2	Semenanjung The Peninsula 465.54 MW	Semenanjung The Peninsula 365.50 MW	2021
	Sabah dan Labuan Sabah and Labuan 45.00 MW	Sabah dan Labuan Sabah and Labuan 0.00 MW	
LSS3	390.88 MW	390.88 MW	2022
LSS@ MEnTARI	823.06 MW	0.00 MW	2023

Projek-projek LSS di Sabah disasarkan akan disiapkan selewat-lewatnya pada 2023 atau 2024. Lanjutan pelaksanaan Mekanisme Kawal Selia Berasaskan Insentif (IBR) di Sabah, setakat ini, kesemua projek-projek di Sabah telah memuktamadkan dokumen Perjanjian Pembelian Tenaga (PPA), dan kini lima (5) daripada sembilan (9) projek di Sabah telah mencapai *Financial Close*.

*The LSS projects in Sabah are targeted to be completed by 2023 or 2024. The implementation of the Incentive-Based Regulation (IBR) Mechanism in Sabah has seen all projects in the state finalising their Power Purchase Agreement (PPA) documents, of which five (5) out of nine (9) projects in Sabah have currently achieved Financial Close.*

Pelaksanaan program LSS adalah selaras dengan hasrat Kerajaan untuk memastikan pelaburan dalam bidang TBB memberi manfaat kepada rakyat tempatan serta memberikan kesan limpahan serta-merta kepada ekonomi negara.

*The implementation of the LSS programme is in line with the Government's aspiration to ensure that investments in the RE sector benefit the local population and have an immediate impact on the national economy.*

## Program Pemeteran Tenaga Bersih (NEM) 3.0

### Net Energy Metering (NEM) 3.0 Programme

Mekanisme Pemeteran Tenaga Bersih (NEM) membolehkan pengguna menjana tenaga elektrik daripada solar untuk kegunaan sendiri sebelum dijual ke grid. NEM menggunakan 1-meter dwiarah dengan had kapasiti penjanaan sebanyak 1 MW.

*The Net Energy Metering (NEM) mechanism allows users to generate electricity from solar energy for their own consumption before selling the excess energy back to the grid. NEM utilises a 1-meter bidirectional metering system with a generation capacity limit of 1 MW.*

Berbeza dengan mekanisme *Self-Consumption Solar Power System* (SelCo) di mana tenaga lebihan dari SelCo tidak boleh dijual ke grid, tenaga yang berlebihan dari penjanaan NEM boleh dijual kepada syarikat pembekal elektrik seperti Tenaga Nasional Berhad (TNB) atau Sabah Electricity Sdn. Bhd. (SESB).

*Unlike the Self-Consumption Solar Power System (SelCo) mechanism, where excess energy from SelCo cannot be sold to the grid, the surplus energy generated through NEM can be sold to electricity suppliers such as Tenaga Nasional Berhad (TNB) or Sabah Electricity Sdn. Bhd. (SESB).*

#### Jumlah Kapasiti NEM 3.0 yang Telah Dimohon, 2022 Total Capacity of NEM 3.0 Applied, 2022

##### NEM Rakyat

**60.43 MW**

dengan baki kuota sebanyak 39.57MW  
with a remaining quota of 39.57MW

##### NEM GoMEn

**30.06 MW**

dengan baki kuota sebanyak 69.94 MW  
with a remaining quota of 69.94 MW

##### NEM NOVA

**462.41 MW**

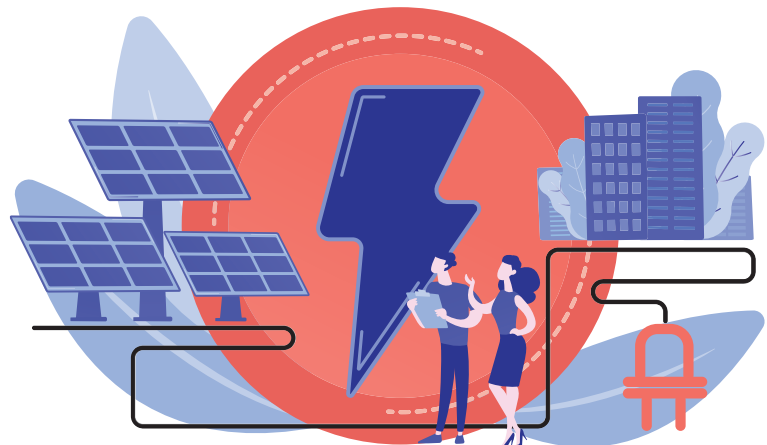
dengan baki kuota sebanyak 137.59 MW  
with a remaining quota of 137.59 MW

##### JUMLAH TOTAL

**522.06 MW**

##### BEROPERASI IN OPERATION

**293.43 MW**



# Kecekapan Tenaga

## Energy Efficiency

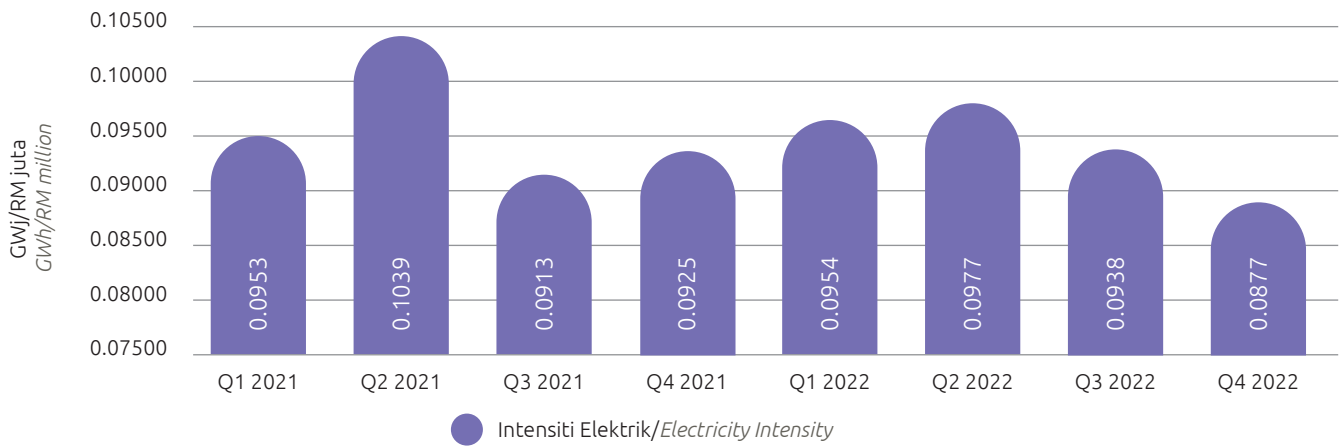
### Intensiti Tenaga Elektrik

Prestasi kecekapan penggunaan tenaga elektrik bagi sesebuah negara sering ditentukan oleh nilai intensiti tenaga elektrik. Intensiti tenaga elektrik merujuk kepada jumlah tenaga elektrik yang diperlukan bagi menghasilkan satu unit Keluaran Dalam Negara Kasar (KDNK), di mana semakin rendah nilai intensiti, maka semakin cekap penggunaan tenaga elektrik tersebut.

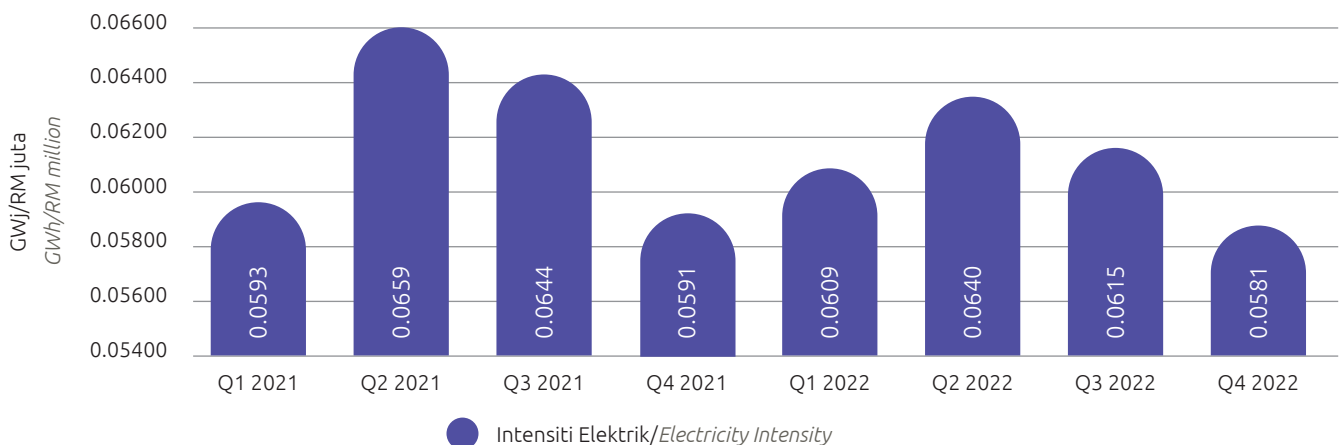
### Electricity Intensity

The efficiency performance of electricity consumption in a country is often determined by the value of electricity intensity. Electricity intensity refers to the amount of electricity required to produce one unit of Gross Domestic Product (GDP), in which lower energy intensity leads to more efficient electricity consumption.

**Intensiti Tenaga Elektrik di Semenanjung, 2021 & 2022**  
*Electricity Intensity in the Peninsula, 2021 & 2022*



**Intensiti Tenaga Elektrik di Sabah, 2021 & 2022**  
*Electricity Intensity in Sabah, 2021 & 2022*

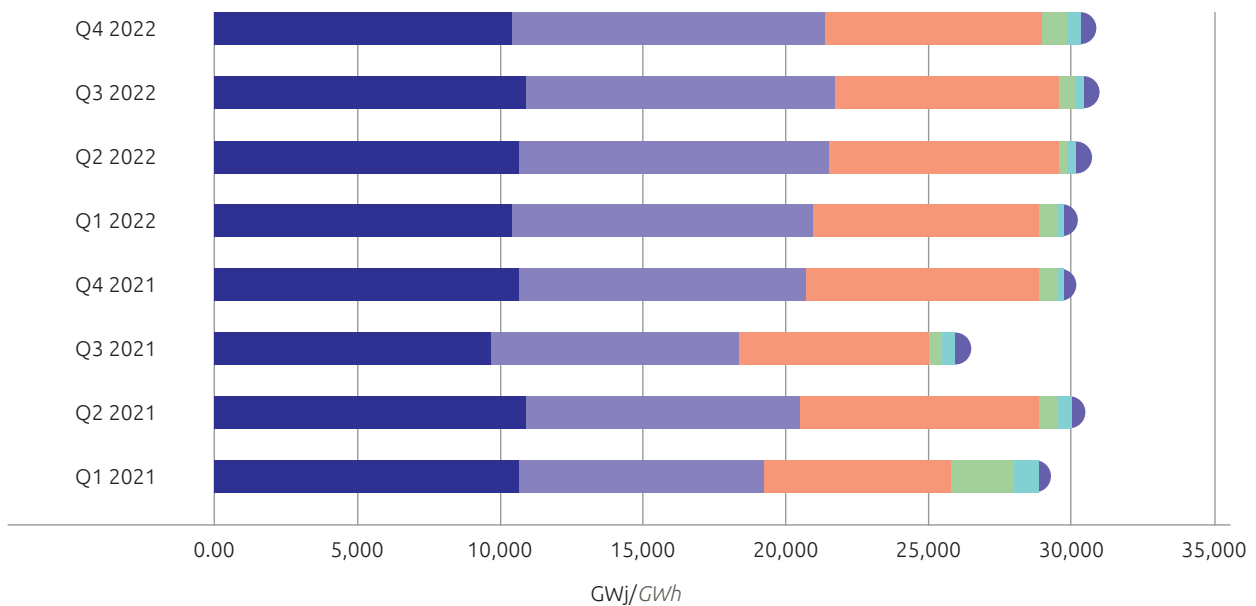




Intensiti tenaga elektrik bagi Semenanjung berkurang sebanyak 2.2% pada 2022 iaitu sebanyak 0.0935 GWj/RM juta berbanding 0.0960 GWj/RM juta pada 2021. Sabah juga mencatatkan pengurangan sebanyak 1.7% pada 2022 iaitu sebanyak 0.0611 GWj/RM juta, berbanding 0.0621 GWj/RM juta pada 2021.

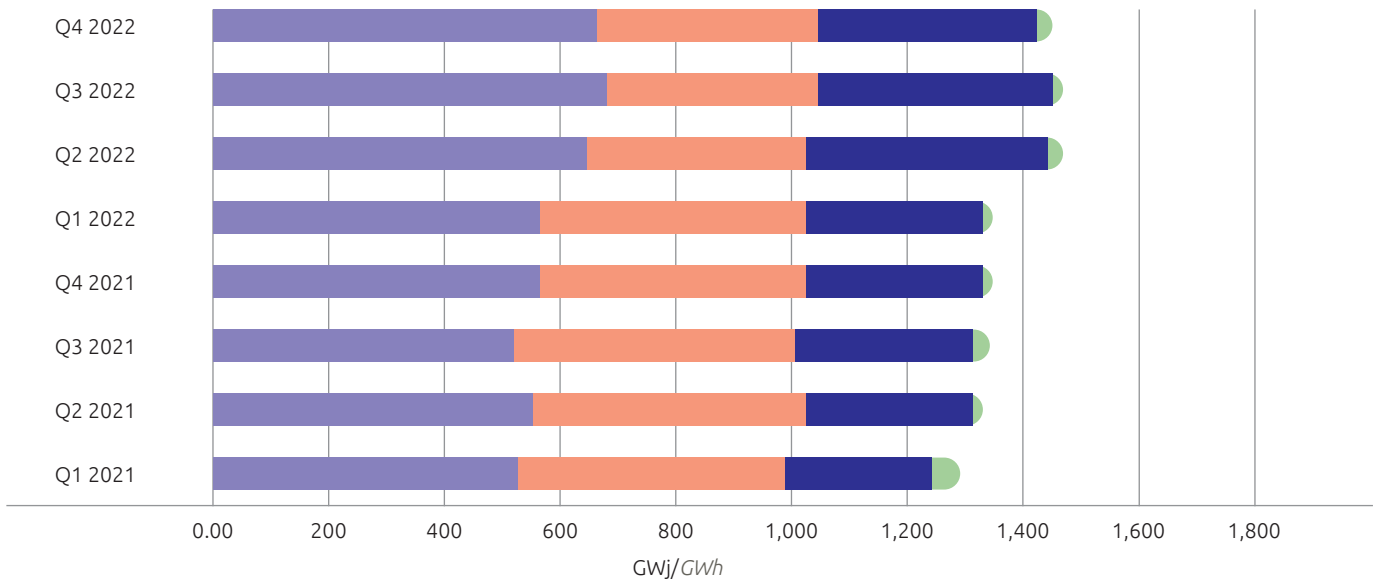
The electricity intensity for the Peninsula decreased by 2.2% in 2022, from 0.0960 GWh/RM million in 2021 to 0.0935 GWh/RM million. Similarly, Sabah recorded a decrease of 1.7% in 2022, from 0.0621 GWh/RM million in 2021 to 0.0611 GWh/RM million.

**Penggunaan Tenaga Elektrik di Semenanjung, 2021 & 2022**  
Electricity Consumption in the Peninsula, 2021 & 2022



	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Perindustrian Industrial	11,163.27	11,717.43	9,543.87	11,542.40	11,268.31	11,362.93	11,732.39	11,245.58
Perdagangan Commercial	8,397.08	9,102.01	7,515.24	9,045.37	9,398.60	9,985.01	9,858.59	10,050.05
Domestik Domestic	7,422.92	8,051.83	8,240.45	7,770.21	7,699.43	8,216.41	8,077.46	7,507.92
Lampu Awam Public Lighting	376.66	372.48	371.38	378.71	384.71	377.27	442.40	391.25
Pertanian Agriculture	164.51	171.31	178.07	168.99	162.06	168.40	169.64	168.47
Perlombongan Mining	35.92	43.86	35.92	48.11	46.21	49.64	67.00	51.90

**Penggunaan Tenaga Elektrik di Sabah, 2021 & 2022**  
*Electricity Consumption in Sabah, 2021 & 2022*



	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
● Perdagangan <i>Commercial</i>	511.85	569.92	510.31	573.54	573.16	622.30	644.46	634.63
● Domestik <i>Domestic</i>	486.41	541.24	554.54	510.02	506.07	541.11	525.40	510.80
● Perindustrian <i>Industrial</i>	248.22	251.13	260.41	263.35	267.22	274.98	279.59	274.43
● Lampu Awam <i>Public Lighting</i>	19.35	16.73	21.28	18.52	19.19	18.97	20.18	19.02

Dari segi penggunaan tenaga elektrik, Semenanjung mencatatkan penggunaan tenaga sebanyak 118,881.62 GWj pada 2022 iaitu peningkatan sebanyak 6.28% berbanding 111,858.01 GWj pada 2021. Sabah pula mencatatkan sebanyak 5,731.53 GWj iaitu peningkatan sebanyak 7.0% berbanding 5,356.82 GWj pada 2021. Peningkatan tenaga elektrik ini adalah sejajar dengan pengoperasian semula di semua sektor pada tahun 2022 pasca pemulihan pandemik COVID-19 yang berlaku sebelum ini.

Di Semenanjung, sektor perdagangan rata-ratanya mencatatkan peningkatan penggunaan tenaga elektrik pada setiap suku tahun. Peningkatan tertinggi bagi sektor ini dapat dilihat pada suku tahun ke-3 iaitu

*In terms of electricity consumption, the Peninsula recorded a usage of 118,881.62 GWh in 2022, an increase of 6.28% compared to 111,858.01 GWh in 2021. Sabah, on the other hand, recorded a consumption of 5,731.53 GWh, indicating a 7.0% increase compared to 5,356.82 GWh in 2021. This increase in electricity consumption aligns with the resumption of operations across all sectors in 2022 following the recovery from the COVID-19 pandemic.*

*The Peninsula's commercial sector consistently recorded an increase in electricity consumption each quarter. The highest increase in this sector was in the third quarter, with significant growth of 31.2% compared to 2021. This is followed by the mining sector, which also experienced*

sebanyak 31.2% berbanding tahun 2021. Ini diikuti dengan sektor perlombongan yang juga mencatatkan peningkatan bagi setiap suku tahun berbanding tahun sebelumnya, di mana pada suku tahun 1 mencatatkan peningkatan sebanyak 28.6% diikuti dengan 86.5% pada suku tahun ke-3 berbanding tahun 2021. Sektor domestik walau bagaimanapun, menunjukkan pengurangan pada suku tahun ke-3 dan ke-4 masing-masing sebanyak 2.0% dan 3.4% pada tahun 2022. Hal ini berkemungkinan disebabkan kebanyakan institusi pendidikan serta organisasi telah kembali beroperasi seperti normal seterusnya menjurus kepada pengurangan penggunaan tenaga bagi sektor domestik.

Di Sabah pula, sektor perdagangan juga mencatatkan peningkatan tertinggi sebanyak 26.3% pada suku tahun ke-3 diikuti dengan sektor perindustrian yang mencatatkan peningkatan sebanyak 9.5% pada suku tahun ke-2 berbanding tahun 2021.

Peningkatan penggunaan tenaga elektrik ini dapat dikaitkan dengan keadaan ekonomi di Malaysia yang semakin pulih dan projek-projek yang dahulunya tergendala disebabkan oleh pandemik COVID-19 dapat dijalankan semula.

Dari segi intensiti tenaga elektrik pula, dapat dilihat pengurangan yang signifikan pada 2022 berbanding 2021. Ini menunjukkan bahawa inisiatif yang dilakukan oleh ST di dalam memberikan kesedaran dan pendedahan pengetahuan kepada orang ramai berhubung penggunaan tenaga dengan cekap telah memberikan impak di kalangan masyarakat.

Antara inisiatif yang telah dilakukan ST adalah penerbitan video beranimasi berkenaan kesedaran penggunaan tenaga yang cekap. Selain itu, Pelan Tindakan Kecekapan Tenaga Nasional (NEEAP) juga merangkumi pelbagai inisiatif kecekapan tenaga bagi pengguna yang berkaitan dalam sektor industri, komersial dan domestik.

*growth in each quarter compared to the previous year. The first quarter saw a 28.6% increase, followed by a 86.5% increase in the third quarter compared to 2021. Domestic sector however, has shown a decrease in the third and fourth quarter with 2.0% and 3.4% respectively in 2022. This may attributed from most of the educational institutions and organisations has resume back to normal which lead to a decrease of energy consumption in the domestic sector.*

*In Sabah, the commercial sector also recorded the highest increase of 26.3% in the third quarter, followed by the industrial sector, which recorded a rise of 9.5% in the second quarter compared to the year 2021.*

*This increase in electricity consumption can be attributed to the improving economic conditions in Malaysia, as well as the resumption of previously delayed projects due to the COVID-19 pandemic.*

*In terms of electricity intensity, a significant reduction can be observed in 2022 compared to 2021. This indicates that the initiatives undertaken by the Commission in raising awareness and providing knowledge to the public regarding efficient energy consumption have made an impact on the community.*

*One of the initiatives carried out by the Commission is the production of animated videos promoting awareness of efficient energy consumption. In addition, the National Energy Efficiency Action Plan (NEEAP) also encompasses various energy efficiency initiatives for users in the industrial, commercial, and domestic sectors.*



## Pelaksanaan Pelan Tindakan Kecekapan Tenaga Nasional (NEEAP)

NEEAP menggariskan strategi untuk pelaksanaan langkah kecekapan tenaga yang diselaraskan dengan baik dan kos efektif dalam sektor perindustrian, komersial dan kediaman.

Matlamat pelan adalah untuk mempromosikan langkah kecekapan tenaga dalam menyumbang kepada pembangunan ekonomi yang mampan, kebajikan sosial dan meningkatkan daya saing negara melalui penggunaan tenaga secara produktif dan lestari.

Pada 2022, pelaksanaan NEEAP merangkumi pemantauan berterusan terhadap langkah-langkah kecekapan tenaga di bawah program-program berikut:

- Program Geran Audit Tenaga Bersyarat 1.0 (EACG 1.0) RMK-11
- Pelaporan secara berkala pemasangan yang tertakluk di bawah Peraturan Pengurusan Tenaga Elektrik Dengan Cekap (PPTEC) 2008
- Program promosi pembelian kelengkapan elektrik bertaraf lima (5) bintang

Sehingga Disember 2022, pelaksanaan NEEAP telah berjaya mencapai penjimatan tenaga elektrik sebanyak 5.78% berbanding jangkaan sasaran iaitu 5.0%. Peratusan penjimatan ini diukur dengan mengambil kira penjimatan tahunan terhasil bagi 2022 berbanding dengan jangkaan penggunaan tenaga elektrik bagi 2022 tanpa pelaksanaan NEEAP.

## Implementation of the National Energy Efficiency Action Plan (NEEAP)

NEEAP outlines strategies for the implementation of well-coordinated and cost-effective energy efficiency measures in the industrial, commercial, and residential sectors.

The plan aims to promote energy efficiency measures that contribute to sustainable economic development and social welfare, and enhance the country's competitiveness through productive and sustainable energy use.

In 2022, the implementation of NEEAP included continuous monitoring of energy efficiency measures under the following programmes:

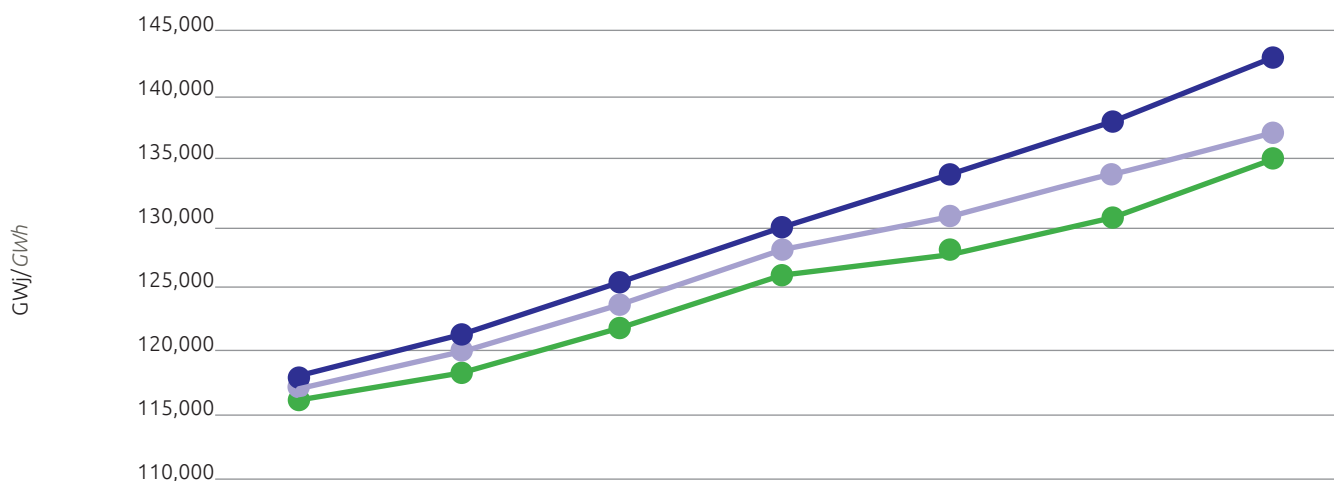
- Energy Audit Conditional Grant 1.0 (EACG 1.0) RMK-11
- Periodic reporting by regulated installations under Efficient Management of Electrical Energy Regulation (EMEER) 2008
- Promotional programme for the purchase of five (5) star-rated electrical appliances

As of December 2022, the implementation of NEEAP successfully achieved electricity savings of 5.78% compared to the expected target of 5.0%. The percentage of these savings was measured by using annual savings for 2022 compared to the expected electricity consumption in 2022 without the implementation of NEEAP.





**Pencapaian Keseluruhan NEEAP, 2016 - 2022**  
*Overall Achievement of NEEAP, 2016 - 2022*



	2016	2017	2018	2019	2020	2021	2022
BAU (GWj) <i>BAU (GWh)</i>	117,110.00	121,431.00	125,885.00	130,474.00	134,830.00	139,206.00	143,326.00
NEEAP (GWj) <i>NEEAP (GWh)</i>	117,022.82	121,045.12	124,784.35	128,188.22	131,046.79	133,730.77	136,164.99
Impak NEEAP (GWj) <i>NEEAP Impact (GWh)</i>	116,274.00	119,777.00	123,231.00	126,424.00	128,966.00	131,352.00	135,045.00
Penjimatan Tahunan (GWj) <i>Annual Saving (GWh)</i>	836	1,654	2,654	4,050	5,846	7,854	8,281
Peratus Penjimatan NEEAP daripada BAU <i>Percentage NEEAP Saving from BAU</i>	0.1%	0.3%	0.9%	1.8%	2.8%	3.9%	5.0%
Peratus Penjimatan Tahunan Sebenar daripada BAU <i>Percentage Actual Annual Saving from BAU</i>	0.71%	1.36%	2.11%	3.1%	4.35%	5.64%	5.78%

Penjimatan tenaga elektrik tahunan yang dicapai sehingga Disember 2022 adalah sebanyak 8,281 GWj bersamaan dengan RM2.035 billion.

Sehingga kini, pencapaian pelaksanaan NEEAP menunjukkan prestasi yang melebihi jangkaan dan pencapaian ini juga turut menyumbang kepada pengurangan pelepasan gas rumah hijau (GHG) sebanyak 4,844.57 ktCO<sub>2</sub>, seterusnya menyumbang kepada sasaran Kerajaan untuk mengurangkan kadar pelepasan GHG sebanyak 45% pada 2030 berbanding aras pelepasan GHG pada 2005.

## Geran Audit Tenaga Bersyarat (EACG) 2.0

Program Geran Audit Tenaga Bersyarat (EACG) 2.0 adalah untuk:

- Menyediakan kemudahan pembiayaan kewangan melalui geran bersyarat selama lima (5) tahun (2021 hingga 2025) sebagai pemangkin bagi pelaksanaan audit tenaga, bertujuan untuk mengenal pasti jumlah penggunaan tenaga elektrik serta menetapkan *baseline*.
- Menyediakan platform bagi pelaksanaan langkah penjimatan tenaga berdasarkan kepada laporan audit tenaga tersebut.
- Memastikan penjimatan penggunaan tenaga elektrik terhasil melalui pematuhan kepada perjanjian pelaksanaan langkah-langkah penjimatan tenaga berdasarkan kepada laporan audit tenaga.
- Pembangunan kapasiti pengaudit tenaga bagi memenuhi permintaan aktiviti audit tenaga di sektor industri dan komersial.
- Memupuk kesedaran mengenai kepentingan audit tenaga di kalangan pemilik pemasangan industri di Malaysia.

Program ini dirancang untuk menyokong dasar Kerajaan untuk mengurangkan pelepasan GHG sebanyak 45% pada 2035 dan mencapai sasaran penjimatan tenaga elektrik yang ditetapkan dalam NEEAP 2016-2025.

Sebanyak 420 pemasangan industri dan 230 pemasangan komersial dijangka menerima geran ini dari 2021 hingga 2025 untuk melaksanakan

*The annual electricity savings achieved until December 2022 amounted to 8,281 GWh, which is equivalent to RM2.035 billion.*

*To date, the implementation of NEEAP has shown performance that exceeded expectations and contributed to the reduction of greenhouse gas (GHG) emissions by 4,844.57 ktCO<sub>2</sub>, further contributing to the Government's target to reduce the rate of GHG emissions by 45% in 2030 compared to the level of GHG emissions in 2005.*

## Energy Audit Conditional Grant (EACG) 2.0

*The Energy Audit Conditional Grant (EACG) 2.0 Programme is designed to:*

- *Provide financing facilities through conditional grants for five (5) years (2021 to 2025) as a catalyst for the implementation of energy audits, aimed at identifying the amount of electricity consumption and setting a baseline.*
- *Provide a platform for implementing energy saving measures based on the energy audit report.*
- *Ensure that electricity consumption savings are achieved through compliance with the implementation agreement of energy saving measures based on the energy audit report.*
- *Develop energy auditors' capacity to meet the demand for energy audits in industrial and commercial sectors.*
- *Foster awareness on the importance of energy audits among industrial installations owners in Malaysia.*

*This programme is designed to support the Government's policy to reduce GHG emissions by 45% by 2035 and achieve the electricity savings targets set in the NEEAP 2016-2025.*

*A total of 420 industrial installations and 230 commercial installations are expected to receive these grants from 2021 to 2025 to conduct energy audits in their respective premises. Based on the energy audit reports, these installations will implement recommended energy-saving projects.*

audit tenaga di pemasangan masing-masing. Hasil laporan audit tenaga tersebut, pemasangan ini akan menjalankan projek-projek penjimatan tenaga yang disyorkan.

Sehingga 2022, 66 pemasangan industri dan 42 pemasangan komersial telah menerima geran ini.

Program EACG 2.0 ini dijangka dapat menyumbangkan pengurangan penggunaan tenaga elektrik sebanyak 1,402 GWj, bersamaan dengan RM552,963,549 bagi tempoh RMK-12.

Di samping itu, program ini juga memberi pendedahan kepada pihak industri mengenai pelaksanaan langkah-langkah penjimatan tenaga secara holistik dan sistematis dengan bantuan aktiviti audit tenaga.

## Peraturan Pengurusan Tenaga Elektrik Dengan Cepak (PPTEC) 2008

### Penguatkuasaan PPTEC 2008

Bagi menggalakkan tadbir urus yang baik berkaitan pengurusan tenaga di kalangan pengguna kuasa besar, Kerajaan telah menguatkuasakan PPTEC 2008 pada 15 Disember 2008. Melalui peraturan ini, pemasangan yang menggunakan tenaga elektrik menyamai atau melebihi 3,000,000 kWj dalam tempoh enam (6) bulan berturut-turut perlu melantik Pengurus Tenaga Elektrik (PTE) Berdaftar dan menghantar laporan berkala setiap enam (6) bulan kepada ST.

Aktiviti penguatkuasaan juga dilaksanakan terhadap pemasangan yang tidak melantik PTE bagi meningkatkan kadar pematuhan terhadap peraturan ini. Pada 2022, penguatkuasaan PPTEC 2008 dilaksanakan terhadap 24 pemasangan. Hasil daripada aktiviti pemantauan dan penguatkuasaan yang dilaksanakan, pada 2022, pematuhan kepada PPTEC 2008 meningkat kepada 78% iaitu pematuhan di 1,520 pemasangan berbanding 74% atau 1,439 pemasangan pada 2021.

*As of 2022, 66 industrial installations and 42 commercial installations have received these grants.*

*The EACG 2.0 Programme is expected to contribute a reduction in electricity consumption of 1,402 GWh, equivalent to RM552,963,549 for the RMK-12 period.*

*Furthermore, the programme also provides exposure to the industry on the holistic and systematic implementation of energy-saving measures with the assistance of energy audit activities.*

## Efficient Management of Electrical Energy Regulations (EMEER) 2008

### Enforcement of EMEER 2008

*To encourage good governance in energy management among large power consumers, the Government enforced the EMEER 2008 on 15 December 2008. Under this regulation, installations that consume electricity equal to or exceeding 3,000,000 kWh over a period of six (6) consecutive months are required to appoint a Registered Electrical Energy Manager (REEM) and submit periodic reports every six (6) months to the Commission.*

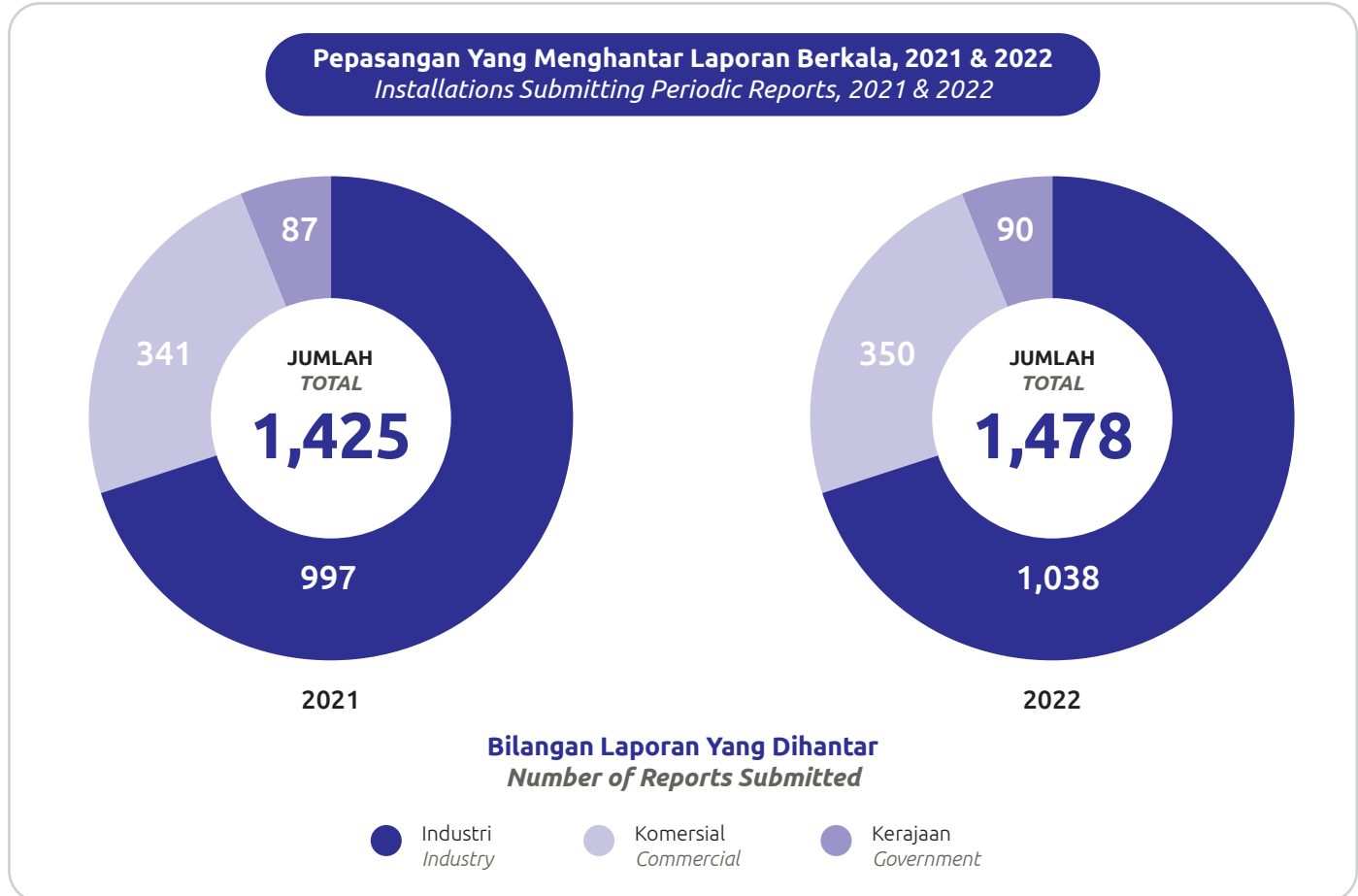
*Enforcement activities are also carried out against installations that fail to appoint an REEM in order to increase compliance with this regulation. In 2022, enforcement of EMEER 2008 was conducted on 24 installations. As a result of monitoring and enforcement activities, compliance with EMEER 2008 increased to 78% in 2022, with 1,520 installations in compliance, compared to 74% or 1,439 installations in 2021.*

**Pemantauan Langkah-Langkah Kecekapan Tenaga di bawah PPTEC 2008**

Sepanjang 2022, sebanyak 1,478 pemasangan menghantar laporan berkala berbanding 1,425 pada 2021, menunjukkan peningkatan sebanyak 3.72%.

**Monitoring Energy Efficiency Measures under EMEER 2008**

Throughout 2022, a total of 1,478 installations submitted periodic reports compared to 1,425 in 2021, showing an increase of 3.72%.

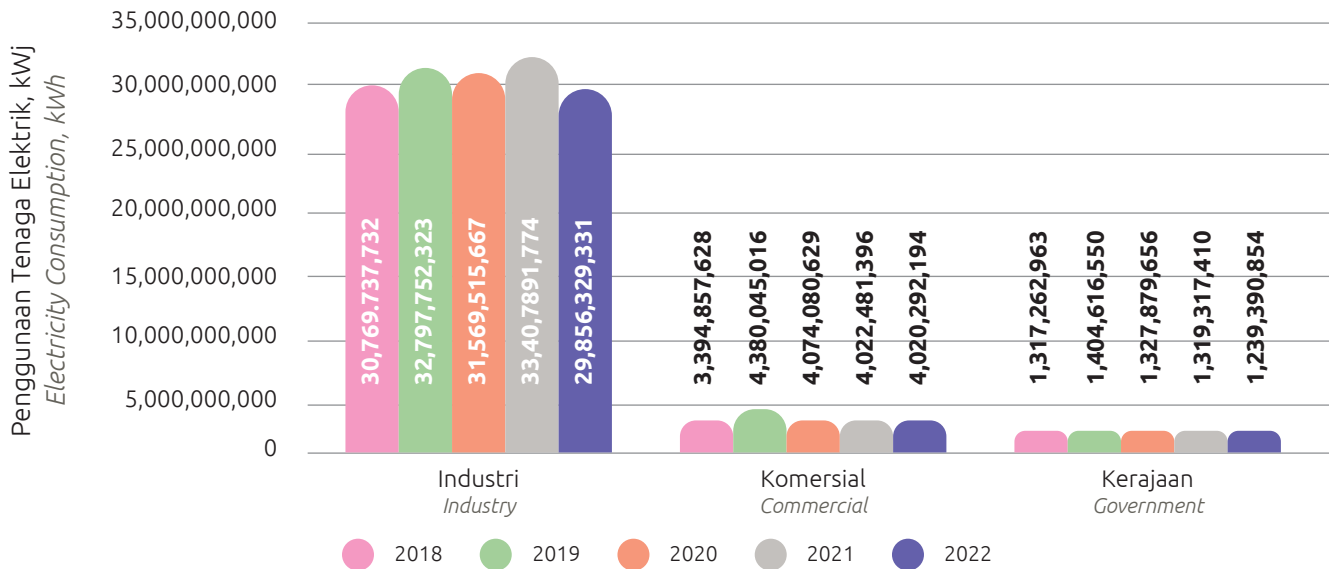


Daripada laporan berkala yang dihantar oleh pemasangan melalui sistem dalam talian *Energy Management Information System* (EMIS) sejak 2018, beberapa analisis dapat dijalankan bagi menilai tahap kecekapan tenaga yang terhasil daripada pematuhan kepada PPTEC 2008.

From the periodic reports submitted by installations through the online *Energy Management Information System* (EMIS) since 2018, several analyses can be conducted to assess the level of energy efficiency achieved through compliance with EMEER 2008.



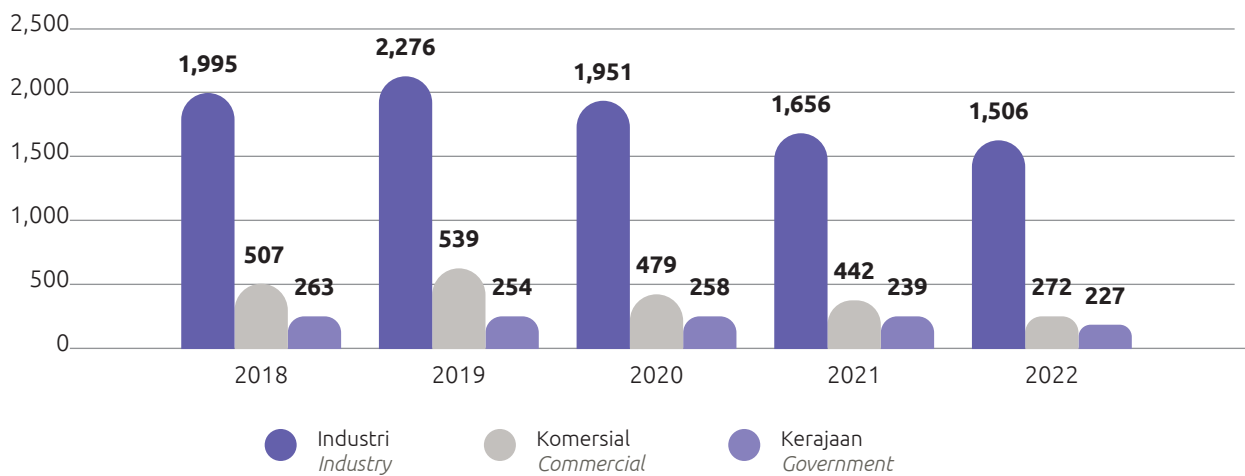
**Trend Penggunaan Tenaga Elektrik, 2018 - 2022**  
*Electricity Consumption Trend, 2018 - 2022*



Penggunaan tenaga elektrik bagi 2022 adalah menurun bagi ketiga-tiga sektor di bawah PTEC 2008 disebabkan majoriti pemasangan untuk ketiga-tiga sektor ini hanya akan menghantar laporan berkala kedua bagi tahun 2022 bermula dari Januari 2023.

*The electricity consumption for 2022 has decreased for all three sectors under EMEER 2008 due to the majority of installations in these sectors only submit their second periodic reports for 2022 starting January 2023.*

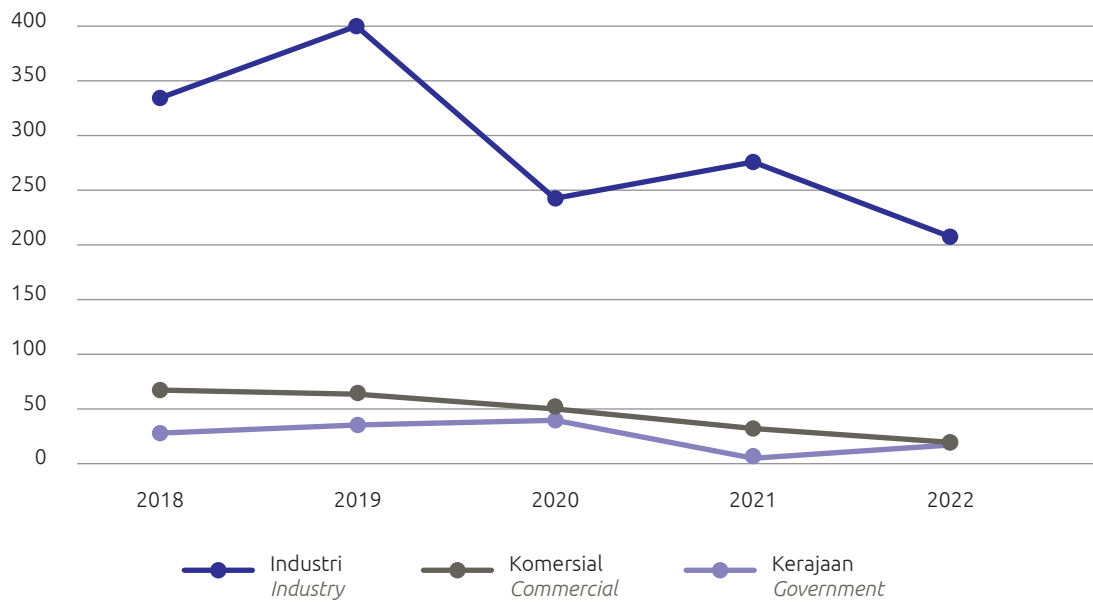
**Bilangan Langkah-Langkah Kecekapan Tenaga yang Dilaksanakan, 2018 - 2022**  
*Number of Energy Efficiency Measures Implemented, 2018 - 2022*



Terdapat penurunan dalam pelaksanaan langkah-langkah kecekapan tenaga di ketiga-tiga sektor di bawah PPTec 2008 dari 2020 sehingga 2022. Andaian bagi penurunan ini adalah kebanyakan pemasangan masih berada dalam fasa pemulihan pasca pandemik COVID-19, di mana fokus pemilik pemasangan adalah lebih kepada pemulihan operasi-operasi harian.

*There has been a decrease in the implementation of energy efficiency measures in all three sectors under EMEER 2008 from 2020 to 2022. The assumption for this decline is that most installations are still in the post-COVID-19 pandemic recovery phase, in which the focus of installation owners is primarily on restoring daily operations.*

**Penjimatan Tenaga yang Direkodkan di bawah PPTec 2008, 2018 - 2022**  
*Reported Electricity Savings under EMEER 2008, 2018 - 2022*



Penjimatan tenaga yang dilaporkan oleh pemasangan di bawah PPTec 2008 turut menunjukkan penurunan dari 2020 sehingga 2022 berbanding sebelum tempoh pandemik COVID-19, selari dengan penurunan bilangan langkah-langkah kecekapan tenaga yang dilaksanakan di pemasangan tersebut.

*Similarly, the reported energy savings by installations under EMEER 2008 have shown a decline from 2020 to 2022 compared to the period before the COVID-19 pandemic, aligning with the decrease in the number of energy efficiency measures implemented in those installations.*

**Penjimatan Tenaga Tahunan, 2022**  
*Annual Energy Savings, 2022*

**Industri**  
*Industrial*

**1,439.54**  
GWj/GWh

**Komersial**  
*Commercial*

**235.96**  
GWj/GWh

**Bangunan Kerajaan**  
*Government Facilities*

**127.83**  
GWj/GWh

## Pencapaian Program *Sustainability Achieved Via Energy Efficiency (SAVE) 3.0*

Program *Sustainability Achieved Via Energy Efficiency (SAVE) 3.0* adalah kesinambungan daripada Program SAVE 1.0 dan 2.0 yang dilaksanakan pada 2011 dan 2021. Kejayaan Program SAVE 1.0 dan SAVE 2.0 antaranya berjaya menjimatkan tenaga sebanyak 158.1 GWj dan 55.17 GWj.

Sustainable Energy Development Authority (SEDA) Malaysia dilantik sebagai agensi pelaksana Program SAVE 3.0 yang bertanggungjawab terhadap pelaksanaan keseluruhan program dengan kerjasama ST. Program SAVE 3.0 menawarkan e-rebat kepada pengguna kategori domestik untuk pembelian peralatan elektrik berlabel cekap tenaga empat (4) atau lima (5) Bintang yang dikeluarkan oleh ST seperti berikut;

- Penyaman Udara
- Peti Sejuk
- Mesin Basuh
- Televisyen
- Ketuhar Gelombang Elektrik; dan
- Periuk Nasi Elektrik

Setiap pengguna domestik berdaftar dengan syarikat penyedia utiliti seperti TNB, Sarawak Energy Berhad (SEB) dan SESB layak menebus seunit e-rebat bernilai RM200 di kedai berdaftar. Objektif utama pemberian e-rebat di bawah Program SAVE 3.0 adalah:

- i. Menyokong polisi dan sebagai salah satu inisiatif pelan tindakan kecekapan tenaga di bawah NEEAP sehingga tahun 2025;
- ii. Menggalakkan pasaran tempatan bagi peralatan elektrik cekap tenaga menjadi lebih kompetitif dari segi harga dan meningkatkan *market share* bagi peralatan cekap tenaga empat (4) dan lima (5) bintang;
- iii. Mempromosi penggunaan peralatan elektrik berlabel cekap tenaga di kalangan pengguna melalui pemberian insentif.

## *Performance of the Sustainability Achieved Via Energy Efficiency (SAVE) 3.0 Programme*

*The Sustainability Achieved Via Energy Efficiency (SAVE) 3.0 Programme is a continuation of the SAVE 1.0 and 2.0 Programmes implemented in 2011 and 2021. The success of the SAVE 1.0 and SAVE 2.0 Programmes includes energy savings of 158.1 GWh and 55.17 GWh, respectively.*

*The Sustainable Energy Development Authority (SEDA) Malaysia has been appointed as the implementing agency for the SAVE 3.0 Programme, responsible for the overall programme implementation in collaboration with the Commission. The SAVE 3.0 Programme offers e-rebates to domestic consumers for the purchase of energy-efficient electrical appliances with a four (4) or five (5) star rating issued by the Commission, as follows:*

- *Air conditioner*
- *Refrigerator*
- *Washing machine*
- *Television*
- *Electric microwave*
- *Electric rice cooker*

*Every domestic consumer registered with utility providers such as TNB, Sarawak Energy Berhad (SEB), and SESB is eligible to redeem one e-rebate unit worth RM200 at participating registered stores. The primary objectives of providing e-rebates under the SAVE 3.0 Programme are:*

- i. Support the policy and serve as one of the energy efficiency action plan initiatives under NEEAP until 2025.*
- ii. Encourage the local market for energy-efficient electrical appliances to become more competitive in terms of price and increase market share for four (4) and five (5) star energy-efficient appliances.*
- iii. Promote the use of energy-efficient labelled electrical appliances among consumers through incentives.*

Melalui pemberian e-rebat ini, pengguna dapat menikmati pengurangan kos pembelian peralatan elektrik cekap tenaga empat (4) atau lima (5) bintang berbanding peralatan elektrik yang kurang cekap tenaga yang lebih murah. Kejayaan program SAVE 3.0 antaranya adalah berjaya menjimatkan tenaga sebanyak 110.7 GWj setahun.

*Through the provision of these e-rebates, consumers can enjoy reduced costs when purchasing energy-efficient electrical appliances with four (4) or five (5) star ratings compared to less energy-efficient appliances that may be cheaper. One of the successes of the SAVE 3.0 Programme is achieving an annual energy savings of 110.7 GWh.*

## Sorotan Utama

### Main Highlights

#### Pelaksanaan Program Bidaan LSS@MEntARI

Kementerian Tenaga dan Sumber Asli (KeTSA) melalui ST telah melaksanakan program bidaan kompetitif LSS@MEntARI pada Mei 2020 dengan sasaran kapasiti 1,000 MW untuk kemasukan tahun 2022 dan 2023.

Pelaksanaan program ini merupakan antara inisiatif Kerajaan untuk memulihkan dan merangsang ekonomi berikutan penularan wabak COVID-19 yang menjejaskan ekonomi negara.

Ia juga bertujuan untuk merancakkan pembangunan industri pembekalan elektrik negara khususnya industri TBB.

Program LSS@MEntARI dimuktamadkan pada 12 Mac 2021 dengan pengeluaran *Letter of Notification* kepada pembida-pembida yang disenarai pendek untuk membangunkan projek LSS di Semenanjung. Penetapan SCOD untuk projek LSS@MEntARI adalah dari 2022 hingga 2023.

Kesemua 30 pembida yang disenarai pendek telah memuktamadkan PPA dengan pihak TNB pada Ogos 2021.

Daripada 30 projek yang dianugerahkan dalam bidaan LSS@MEntARI, 23 projek telah mencapai *Financial Close*, di mana urusan kewangan dengan pihak perbankan telah diselesaikan.

#### Implementation of the LSS@MEntARI Bidding Programme

*The Ministry of Energy and Natural Resources (KeTSA), through the Commission, has implemented a competitive bidding programme for the LSS@MEntARI project in May 2020, with a target entry capacity of 1,000 MW for the year 2022 and 2023.*

*The implementation of this programme is one of the Government's initiatives to revive and stimulate the economy in response to the impact of the COVID-19 pandemic on the country's economy.*

*It also aims to promote the development of the electrical supply industry, particularly the RE industry, and drive its growth.*

*The LSS@MEntARI programme was concluded on 12 March 2021 with the issuance of a Letter of Notification to shortlisted bidders to develop the LSS project in the Peninsula. The SCOD for the LSS@MEntARI projects is set from 2022 to 2023.*

*All 30 shortlisted bidders finalised the PPA with TNB in August 2021.*

*Out of the 30 projects awarded in the LSS@MEntARI bidding, 23 projects have reached Financial Close, indicating that financial arrangements with banking institutions have been finalised.*



Beberapa projek juga telah mencapai pelaksanaan lebih 80% dan dijangka siap mengikut tarikh SCOD yang ditetapkan.

Pelaksanaan program LSS@MEnTARI adalah selaras dengan hasrat Kerajaan untuk memastikan pelaburan dalam bidang TBB memberi manfaat kepada rakyat tempatan serta memberikan kesan limpahan serta-merta kepada ekonomi negara.

Di samping itu, pelaksanaan program ini juga selaras dengan hasrat Kerajaan bagi mencapai sasaran kapasiti TBB sebanyak 31% bagi keseluruhan di Malaysia pada 2025 dan 40% pada 2040, seperti yang ditetapkan dalam Mesyuarat JPPPET pada 23 Disember 2021.

### **Kajian Rintis Battery Energy Storage System (BESS) di Semenanjung**

Dalam usaha untuk meningkatkan sumber TBB dalam sistem pembekalan elektrik di Semenanjung, teknologi penyimpanan tenaga juga perlu dikaji bagi memastikan penjana tenaga solar dapat diguna pakai secara optimum.

Sehubungan itu, kajian *Battery Energy Storage System* (BESS) dilaksanakan pada 14 Februari 2022 sehingga 15 Oktober 2022, bertujuan untuk meneliti keterterapan teknologi BESS dalam rangkaian pembekalan TBB di Semenanjung.

Di bawah seliaan ST, sebanyak lapan (8) aplikasi kajian telah dilaksanakan bagi meneliti impak BESS terhadap sistem grid Semenanjung.

Hasil kajian akan dibentangkan di Mesyuarat JPPPET untuk syor dan hala tuju yang seterusnya.

### **Permulaan Kajian BESS di Sabah**

Di Sabah, dua (2) stesen jana kuasa diesel iaitu Stesen Jana Kuasa Tawau Canopy dan Tawau GT2 masing-masing berkapasiti 12 MW dan 14 MW akan menamatkan operasi pada Disember 2023. Bukan setakat itu, sebanyak tiga (3) stesen jana kuasa diesel lagi iaitu Stesen Jana Kuasa Kubota (60 MW), Stesen Jana Kuasa Sandakan (71 MW) dan Stesen Jana Kuasa Tawau DG Rehab (10 MW) juga akan menamatkan

*Several projects have also achieved implementation progress of over 80% and are expected to be completed according to the designated SCOD dates.*

*The implementation of the LSS@MEnTARI programme aligns with the Government's intention to ensure that investments in the RE sector benefit the local population and have an immediate spillover impact on the national economy.*

*Furthermore, the programme's implementation is in line with the Government's goal of achieving a RE capacity target of 31% nationwide by 2025 and 40% by 2040, as set in the JPPPET Meeting on 23 December 2021.*

### **A Pilot Study on Battery Energy Storage System (BESS) in the Peninsula**

*In an effort to enhance RE sources in the power supply system in the Peninsula, energy storage technologies also need to be studied to ensure the optimal utilisation of solar energy generation.*

*Accordingly, the Battery Energy Storage System (BESS) study was conducted from 14 February 2022 to 15 October 2022, aiming to examine the applicability of BESS technology in the RE supply network in the Peninsula.*

*Under the Commission's supervision, a total of eight (8) research applications have been conducted to examine the impact of BESS on the Peninsula's grid system.*

*The findings of these studies will be presented at the JPPPET Meeting for further recommendations and directions.*

### **Commencement of BESS Study in Sabah**

*In Sabah, two (2) diesel power plants, namely the Tawau Canopy Power Station and Tawau GT2, with a capacity of 12 MW and 14 MW respectively, will cease operations in December 2023. In addition, three (3) more diesel power plants, namely the Kubota Power Plant (60 MW), Sandakan Power Plant (71 MW) and Tawau DG Rehab Power Plant (10 MW), will also cease operations by the end of 2024. Furthermore, the Serudong Power Plant*

operasi hujung 2024. Selain itu, Stesen Jana Kuasa Serudong (33 MW) dan Stesen Jana Kuasa Libaran (30 MW) akan turut menamatkan operasi pada suku pertama 2025.

Menyedari kegentingan situasi tersebut, terdapat keperluan untuk membina stesen jana kuasa baharu bagi mengatasi kekurangan kapasiti penjanaan berjumlah 230 MW di negeri tersebut menjelang 2025 dan 2026.

Sehubungan itu, Mesyuarat Susulan Kepada Mesyuarat JPPPET Sabah Bil. 1/2021 pada 22 Jun 2021 memutuskan salah satu pilihan penjanaan baharu adalah dengan meneroka konsep pembangunan stesen jana kuasa LSS bersekali dengan teknologi BESS.

Di bawah mekanisme IBR, ST telah meluluskan agar pihak SESB melaksanakan kajian dan penilaian yang sewajarnya bagi memastikan sistem grid di Sabah kekal selamat apabila stesen jana kuasa BESS-LSS memulakan operasi kelak.

## Program Tenaga Hijau Korporat

Pada 31 Oktober 2022, lanjutan permintaan terhadap bekalan tenaga elektrik hijau yang kian meningkat, Kerajaan telah memperkenalkan Program Tenaga Hijau Korporat (CGPP) bagi membolehkan syarikat-syarikat tempatan yang berhasrat untuk mengurangkan jejak karbon menggunakan TBB melalui pemasangan sistem solar fotovolt (PV). CGPP juga dijangka dapat menjana pelaburan yang dianggarkan melebihi RM2 bilion.

Sebelum CGPP diperkenalkan, syarikat-syarikat di Malaysia hanya berpeluang untuk memenuhi komitmen penggunaan elektrik hijau melalui pemasangan sistem solar PV di premis bangunan masing-masing di bawah program NEM dan SelCo. Di samping itu, syarikat-syarikat boleh membeli sijil TBB atau membuat langganan Tarif Elektrik Hijau (GET).

Melalui mekanisme Perjanjian Pembelian Tenaga Maya (VPPA) yang diguna pakai oleh CGPP, syarikat-syarikat korporat yang beroperasi di Malaysia yang juga merupakan pelanggan TNB perlu menandatangani perjanjian bersama penjana tenaga solar bagi

(33 MW) and Libaran Power Plant (30 MW) will cease operations in the first quarter of 2025.

*Realising the urgency of the situation, there is a need to construct new power plants to address the 230 MW generation capacity shortfall in the state by 2025 and 2026.*

*Thus, the Mesyuarat Susulan Kepada Mesyuarat JPPPET Sabah Bil. 1/2021 on 22 June 2021 has decided that one of the options for new generation capacity is to explore the concept of developing LSS power stations together with BESS technology.*

*Under the IBR mechanism, the Commission has approved SESB to conduct the necessary studies and assessments to ensure the grid system in Sabah remains secure when the BESS-LSS power plant commences its operations in the future.*

## Corporate Green Power Programme

*On 31 October 2022, in response to the growing demand for green energy supply, the Government introduced the Corporate Green Power Programme (CGPP) to enable local companies aspiring to reduce their carbon footprint to utilise RE through the installation of photovoltaic (PV) solar systems. The CGPP is also expected to generate over RM2 billion investments.*

*Prior to the introduction of the CGPP, Malaysian companies fulfil their green electricity consumption commitments through the installation of PV solar systems on their premises under the NEM and SelCo programmes. Additionally, companies could purchase RE certificates or subscribe to the Green Electricity Tariff (GET).*

*Through the Virtual Power Purchase Agreement (VPPA) mechanism utilised by the CGPP, corporate companies operating in Malaysia, who are also TNB customers, are required to sign agreements with solar power generators for the purchase of virtual green energy. A total capacity of 600 MW was offered through the CGPP, and PV solar power plants approved for this programme must commence operations no later than 2025.*

pembelian tenaga hijau maya. Sejumlah 600 MW kapasiti telah ditawarkan melalui CGPP di mana loji jana kuasa solar PV yang diluluskan untuk program ini hendaklah mula beroperasi tidak lewat dari 2025.

Di bawah program CGPP juga, syarikat korporat yang layak boleh memeterai Perjanjian Tenaga Hijau Korporat (CGPA) dengan penjana tenaga solar bagi penjualan dan pembelian TBB secara maya dengan terma dan syarat yang dipersetujui bersama. CGPA merupakan suatu perjanjian dua hala yang memperincikan struktur penetapan harga yang dipersetujui di antara pihak syarikat korporat dan penjana tenaga solar.

*Information Guide For Corporate Green Power Programme (For Solar PV Plant)* telah diterbitkan ST pada 7 November 2022, bertujuan memberi maklumat mengenai mekanisme VPPA dan kaedah penyertaan program CGPP kepada kumpulan sasaran seperti penjana tenaga solar, pengguna korporat, syarikat utiliti dan pihak lain yang relevan.

Objektif panduan merangkumi perkara-perkara berikut:

- Pengenalan CGPP di Semenanjung sebagai platform untuk memudahkan entiti perniagaan menggunakan TBB dalam operasi perniagaan.
- Penerangan terhadap prinsip asas CGPP.
- Penetapan syarat dan kelayakan untuk menyertai CGPP.
- Penerangan berkaitan proses permohonan dan kelulusan serta dokumen yang perlu dikemukakan untuk penyertaan dalam CGPP.
- Penetapan peranan, fungsi dan tanggungjawab pihak yang berkaitan di bawah CGPP.
- Peruntukan bagi apa-apa perkara lain yang mungkin atau bersampingan dengan pelaksanaan CGPP.

Selain pembangunan panduan, ST turut menyediakan soalan-soalan lazim untuk membantu pemahaman terperinci pengguna yang berminat mengenai konsep CGPP termasuk mekanisme *New Enhanced Dispatch Arrangement* (NEDA).

*Under the CGPP programme, eligible corporate companies can enter into a Corporate Green Power Agreement (CGPA) with solar power generators for virtual trading of RE certificates based on mutually-agreed terms and conditions. The CGPA is a bi-lateral agreement that outlines the agreed-upon pricing structure between the corporate company and the solar power generator.*

*The Information Guide for Corporate Green Power Programme (for Solar PV Plant) was published by the Commission on 7 November 2022, aiming to provide information on the VPPA mechanism and the participation methods for the CGPP programme to target groups such as solar power generators, corporate consumers, utility companies, and other relevant parties.*

*The objectives of the guide include the following:*

- *Introduction of the CGPP in the Peninsula as a platform to facilitate business entities in utilising RE in their business operations.*
- *Explanation of the basic principles of the CGPP.*
- *Establishment of criteria and eligibility requirements for participation in the CGPP.*
- *Explanation of the application and approval process, as well as the required documents for participation in the CGPP.*
- *Establishment of the roles, functions, and responsibilities of relevant parties under the CGPP.*
- *Provision for any other matters that may be relevant or associated with the implementation of the CGPP.*

*In addition to developing the guide, the Commission also prepared frequently asked questions (FAQs) to assist interested users in gaining a detailed understanding of the CGPP concept, including the New Enhanced Dispatch Arrangement (NEDA) mechanism.*

## Pelaksanaan Program Minggu Kecekapan Tenaga dan Konservasi (EECW)

Program Minggu Kecekapan Tenaga (EECW) merupakan satu cabang baharu untuk menyebarkan dan mempromosikan lagi peranan dan kepentingan amalan kecekapan tenaga dalam kehidupan seharian, serta berperanan sebagai platform untuk mengetengahkan program-program dan projek kecekapan tenaga yang dirancang di bawah naungan program induk tersebut.

Pelaksanaan Program EECW memberikan pendedahan berskala besar berkaitan program dan aktiviti kecekapan tenaga yang dilaksanakan oleh Kerajaan. EECW turut menyasarkan pelbagai demografi khalayak sasaran seperti pemain industri, pemilik sektor komersial dan ahli akademik semasa pelaksanaannya.

### Seminar Kecekapan Dan Konservasi Tenaga (EEC)

Seminar Kecekapan dan Konservasi Tenaga (EEC) telah diadakan di Putrajaya dengan kehadiran seramai 250 peserta. Seminar EEC melibatkan wakil-wakil sektor Kerajaan, industri, komersial dan institusi pendidikan. Bertemakan *Leading by Example: Paving The Way Towards Energy Efficiency*, topik seminar berkisar tentang polisi dan perundangan berkaitan kecekapan tenaga, EACG 2.0, Pembiayaan EE dan *Best Practice Demonstration Project*.

### Majlis Penyampaian Hadiah Energy Efficiency (EE) Challenge 2022

Untuk 2022, lima (5) kategori *Energy Efficiency (EE) Challenge* dipertandingkan iaitu:

#### #poster-drawing-challenge

Pertandingan mereka bentuk, melukis dan mewarna poster berkaitan kecekapan tenaga serta keselamatan elektrik dan gas.

#### #story-telling-challenge

Pertandingan bersajak, berpidato dan syarahan.

#### #video-making-challenge

Pertandingan penerbitan video berkaitan kecekapan tenaga serta keselamatan elektrik dan gas.

## Implementation of the Energy Efficiency and Conservation Week (EECW) Programme

*The Energy Efficiency and Conservation Week (EECW) Programme is a new initiative to spread and further promote the role and importance of energy efficiency practices in daily life. It also serves as a platform to showcase energy efficiency programmes and projects planned under the main programme.*

*The implementation of the EECW Programme provides large-scale exposure to the energy efficiency programmes and activities implemented by the Government. EECW also targets various demographics, including industry players, commercial sector owners, and academic professionals during its implementation.*

### Energy Efficiency and Conservation (EEC) Seminar

*The Energy Efficiency and Conservation (EEC) Seminar was held in Putrajaya with the participation of 250 attendees. The EEC Seminar involved representatives from the Government, industry, commercial sector, and educational institutions. With the theme "Leading by Example: Paving the Way Towards Energy Efficiency", the seminar revolved around energy efficiency policies and regulations, EACG 2.0, EE Financing, and the Best Practice Demonstration Project.*

### Energy Efficiency (EE) Challenge 2022 Prize Presentation Ceremony

*For 2022, five (5) categories of the Energy Efficiency (EE) Challenge were contested, namely:*

#### #poster-drawing-challenge

*Poster designing, drawing and colouring competition related to energy efficiency as well as electrical and gas safety.*

#### #story-telling-challenge

*Poetry, public speaking, and lecture competition.*

#### #video-making-challenge

*Video production competition related to energy efficiency, as well as electrical and gas safety.*



### #promotional-advertisement-challenge

Pertandingan mereka bentuk iklan kecekapan tenaga serta keselamatan elektrik dan gas.

### #Model Sekolah Paling EE

Pemenang dikira berdasarkan sekolah yang paling memberi kesedaran berkaitan kecekapan tenaga, yang menghantar penyertaan tertinggi per kapita sekolah serta jumlah atau purata markah peserta individu yang dicampur untuk menjadi markah keseluruhan sekolah.

Program *EE Challenge 2022* bermula Jun 2022, termasuk mempromosikan pertandingan ini di 11 Jabatan Pendidikan Negeri (JPN) secara fizikal dan dua (2) taklimat secara dalam talian bagi JPN Selangor, Putrajaya, Kuala Lumpur dan pelajar Universiti Tenaga Nasional (UNITEN).

### #promotional-advertisement-challenge

*Energy efficiency and electrical and gas safety advertisements design competition.*

### #Model Sekolah Paling EE

*The winners were determined based on the school that raised the most awareness about energy efficiency, the school with the highest per capita participation, and the total or average score of individual participants, which were combined to determine the overall school score.*

*The EE Challenge 2022 programme started in June 2022, which included promoting the competition in 11 State Education Departments (JPN) through physical means and two (2) online briefings for JPN Selangor, Putrajaya, Kuala Lumpur, and Universiti Tenaga Nasional (UNITEN) students.*



**Jumlah Penyertaan EE Challenge 2022**  
*Total Participation in the EE Challenge 2022*

Kategori <i>Category</i>	Penyertaan <i>Participation</i>
#poster-drawing-challenge	2,798
#story-telling-challenge	133
#video-making-challenge	221
#promotional-advertisement-challenge	11
#Model Sekolah Paling EE	26
<b>JUMLAH / Total</b>	<b>3,189</b>

### EE Open Day

*EE Open Day* yang berlangsung pada 12 Disember 2022 di Ibu Pejabat ST dihadiri seramai 100 pelajar sekolah di mana selain memberikan pendedahan teknikal berhubung penggunaan tenaga elektrik dengan cekap, ia bertujuan memberikan inspirasi kepada para pelajar untuk terus menerapkan budaya cekap tenaga baik di sekolah mahupun di rumah.

### EE Open Day

*The EE Open Day, held on 12 December 2022 at the Commission Headquarters, was attended by 100 school students. Apart from providing technical exposure regarding efficient electricity usage, the event aimed to inspire students to embrace an energy efficiency culture both at school and at home.*



# 6. MENAMBAH BAIK KUALITI KAWAL SELIA DAN PELAKSANAAN PERKHIDMATAN

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# Pengurusan Aduan

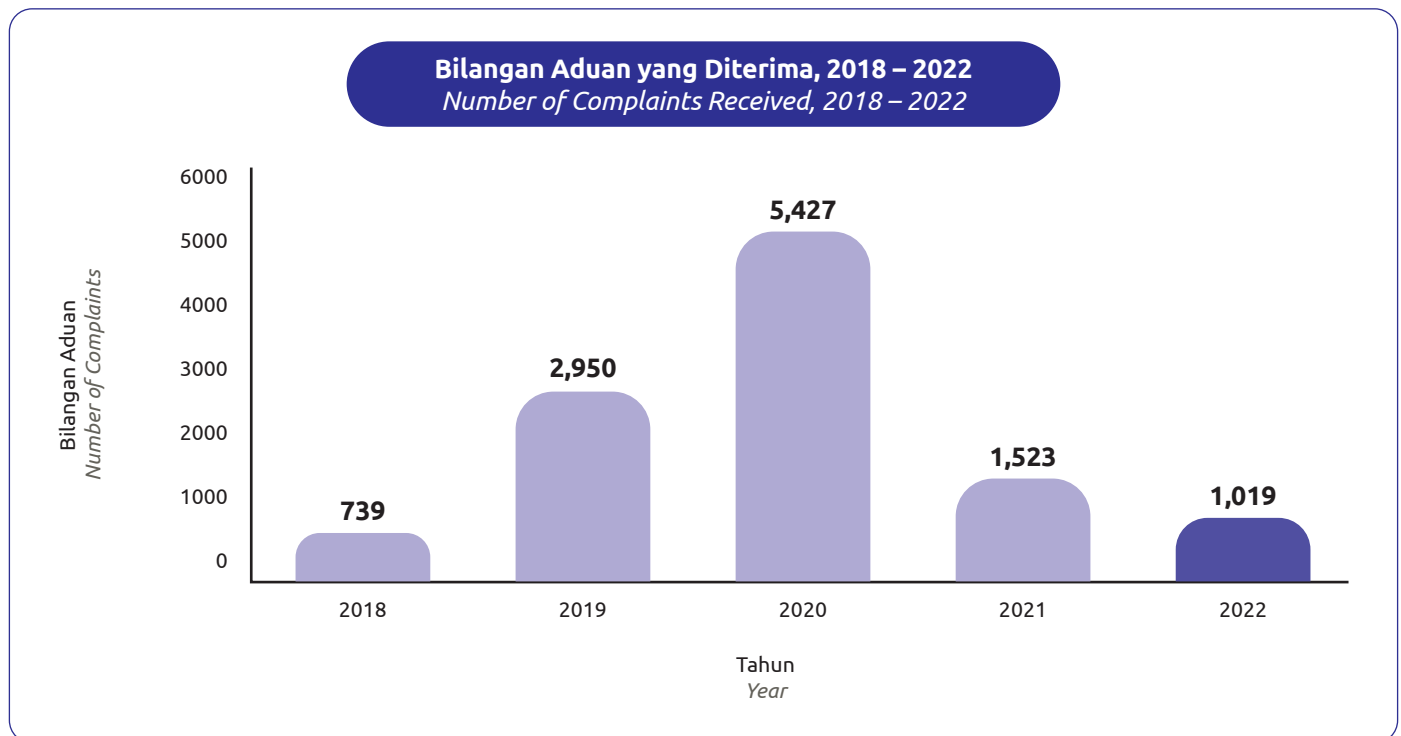
## Complaints Management

Sepanjang 2022, ST menerima sebanyak 1,019 aduan berbanding 1,523 aduan pada tahun sebelumnya. Pengurangan sebanyak 33% ini berikutan pemegang lesen telah dapat menghantar bil elektrik sebenar berbanding secara anggaran ketika Perintah Kawalan Pergerakan dikuatkuasakan di beberapa daerah yang merekodkan jumlah kes COVID-19 yang tinggi.

Daripada jumlah 1,019 aduan yang diterima, sebanyak 935 atau 92.3% aduan telah diselesaikan pada akhir Disember 2022.

Throughout 2022, the Commission received a total of 1,019 complaints compared to 1,523 complaints in the preceding year. This 33% reduction is due to the ability of the licensees to submit actual electricity bills instead of estimates during the enforcement of the Movement Control Order (MCO) in several areas with high COVID-19 cases.

Out of the total 1,019 complaints received, 935 or 92.3% were resolved by the end of December 2022.



**JUMLAH ADUAN**  
TOTAL COMPLAINTS

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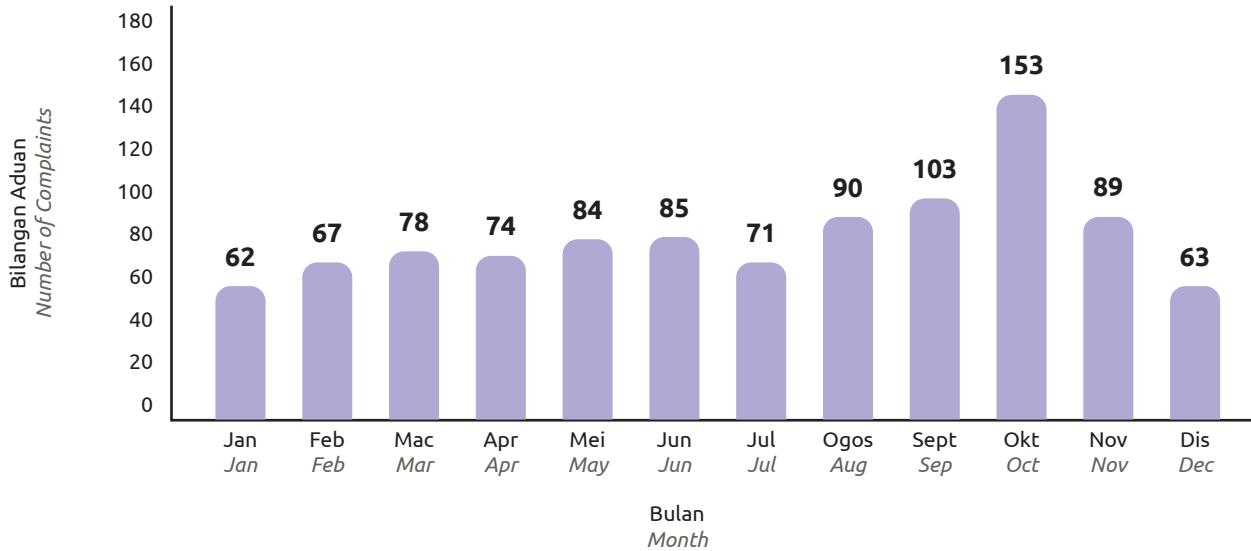
**1,019**

**JUMLAH ADUAN SELESAI**  
TOTAL COMPLAINTS SOLVED

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**935**

**Bilangan Aduan Bulanan, 2022**  
*Monthly Number of Complaints, 2022*



Bulan Oktober mencatat bilangan aduan tertinggi iaitu sebanyak 153 aduan, kebanyakannya berhubung sistem pendawaian elektrik di rumah yang dibina pemaju adalah tidak mengikut standard. ST telah menjalankan siasatan dan telah mengarahkan pihak yang berkenaan untuk membetulkan semula sistem pendawaian berkenaan agar selamat.

*October recorded the highest number of complaints, at 153 complaints, mostly involving electrical wiring systems in homes that were not built according to standards. The Commission has conducted investigations and directed the relevant parties to rectify the wiring system to ensure safety.*

**Bilangan dan Peratusan 10 Kategori Aduan Tertinggi, 2022**  
*Number and Percentage of 10 Highest Complaints by Category, 2022*

Pendawaian Tidak Mengikut Standard <i>Non-Compliant Wiring</i>	135 (13.2%)
Kenaikan Bil Tidak Munasabah <i>Unreasonable Billing Increase</i>	103 (10.1%)
Kes Usikan Pemasangan Meter <i>Meter Tampering Cases</i>	88 (8.6%)
Permohonan dan Penyambungan Bekalan Lewat Melebihi Tiga (3) Hari <i>Late Application and Connection of Supply Exceeding Three (3) Days</i>	50 (4.9%)
Kerja-Kerja Penyelenggaraan oleh TNB/SESB <i>Maintenance Works by TNB/SESB</i>	48 (4.7%)
Voltan Luar Biasa ( <i>Over/Under Voltage</i> ) <i>Abnormal Voltage (Over/Under Voltage)</i>	45 (4.4%)
Bil Anggaran dan Pelarasan Bil <i>Estimated Bills and Bill Adjustments</i>	27 (2.6%)
Pertukaran Kepada Meter Digital/ <i>Smart Meter</i> <i>Conversion to Digital/Smart Meter</i>	25 (2.5%)
Bil Tertunggak <i>Outstanding Bills</i>	25 (2.5%)
Penyambungan Secara Tidak Sah <i>Unauthorised Connections</i>	22 (2.2%)

## Inisiatif Penambahbaikan Pengurusan Aduan *Initiatives for Improving Complaints Management*



**Mengadakan sesi perbincangan bersama pemegang lesen, pemaju atau kontraktor terlibat dalam penyelesaian aduan.**

*Conduct discussion sessions with licensees, developers, or contractors involved in complaints resolution.*



**Mengadakan perbincangan berkala dengan pihak pemegang lesen untuk meningkatkan lagi mutu perkhidmatan kepada pengguna.**

*Conduct regular discussions with licensees to further enhance the quality of service to consumers.*



**Mengadakan bengkel pengukuhan pengurusan aduan lazim bersama pegawai-pegawai penyiasat ST agar pengurusan aduan dapat dijalankan dengan lebih cekap dan efisien.**

*Organise workshops to strengthen the management of common complaints with the Commission's investigators to ensure more efficient and effective complaints management.*



**Memberikan taklimat berhubung ISO pengurusan aduan di Pejabat Kawasan Sabah serta Kelantan & Terengganu.**

*Provide briefings on ISO complaints management at Sabah and Kelantan & Terengganu Regional Offices.*

## Kajian Kepuasan Pelanggan (CSI) ST

### *Customer Satisfaction Index (CSI) ST*

Kajian Kepuasan Pelanggan (CSI) ST 2022 dijalankan bagi mengukur tahap kepuasan pelanggan terhadap perkhidmatan yang disediakan, di samping menambah baik kualiti perkhidmatan ST. CSI ST ini dijalankan pada Ogos dan September 2022 dengan menggunakan borang secara dalam talian. Seramai 486 responden yang mempunyai data lengkap telah dianalisa.

*The Commission's Customer Satisfaction Index (CSI) 2022 was conducted to measure the level of customer satisfaction with the services provided, as well as to improve the quality of the Commission's services. The Commission's CSI survey was conducted in August and September 2022 through an online form. A total of 486 respondents with complete data were analysed.*

**Skop CSI ST, 2022**  
*Commission's CSI Scope, 2022*

**CSI ST 2022 ▶ 91.20%**



**Perkhidmatan**  
*Services*



**Kemudahan**  
*Facilities*



**Layanan**  
*Treatment*



**Masa**  
*Time*



**Kawal Selia**  
*Regulatory*



# Penambahbaikan Terhadap Akta-Akta dan Peraturan-Peraturan

## *Improvements to Acts and Regulations*

### **Kajian Semula dan Pindaan kepada Akta Bekalan Elektrik 1990 [Akta 447] dan Akta Suruhanjaya Tenaga 2001 [Akta 610]**

Kementerian Tenaga dan Sumber Asli (KeTSA) telah meluluskan dasar bagi pelaksanaan kajian semula dan pindaan kepada Akta Bekalan Elektrik [Akta 447] dan Akta Suruhanjaya Tenaga 2001 [Akta 610]. Ini bagi memastikan peruntukan undang-undang tersebut adalah seiring dengan perkembangan industri dan teknologi berkaitan elektrik, selain memastikan undang-undang di bawahnya dapat melindungi hak dan kepentingan pengguna melalui penguatkuasaan dan pengawalseliaan yang lebih mantap.

Keputusan ini juga adalah selaras dengan langkah-langkah untuk meningkatkan ketelusan, kecekapan dan persaingan dalam Industri Bekalan Elektrik Malaysia (MESI) yang mula dilaksanakan sejak 2010 melalui MESI 1.0 dan *Reimagining* MESI 2.0 pada 2019, yang menekankan penambahbaikan ke atas industri bekalan elektrik negara yang lebih mesra rakyat serta tidak memberi implikasi kewangan kepada Kerajaan. Selain itu, pelaksanaan kajian semula dan pindaan juga memfokuskan kepada persediaan industri untuk menghadapi cabaran ekoran kemunculan teknologi disruptif, selain mengambil kira perakuan dasar yang dimuktamadkan di bawah Dasar Tenaga Negara (DTN).

Bagi melaksanakan hasrat tersebut, ST telah melaksanakan Kajian Semula dan Pindaan kepada Akta 447 dan Akta 610 bagi mengenal pasti kelemahan dan kelompangan dalam pelaksanaan atau pemakaian peruntukan sedia ada.

### ***Review and Amendments of the Electricity Supply Act 1990 [Act 447] and the Energy Commission Act 2001 [Act 610]***

*The Ministry of Energy and Natural Resources has approved a policy for the review and amendment of the Electricity Supply Act 1990 [Act 447] and the Energy Commission Act 2001 [Act 610]. This is to ensure that the provisions of these laws are in line with the development of the electricity-related industry and technology, and ensure that the laws under them can protect the rights and interests of consumers through stronger enforcement and regulation.*

*This decision is also in line with efforts to enhance transparency, efficiency, and competitiveness in the Malaysian Electricity Supply Industry (MESI), which has been implemented since 2010 through MESI 1.0 and *Reimagining* MESI 2.0 in 2019. These initiatives emphasise improvements in the country's electricity supply industry that are more consumer-friendly and do not impose financial implications on the Government. Furthermore, the review and amendment also focused on preparing the industry to face challenges arising from disruptive technologies, taking into consideration the policy certifications finalised under the National Energy Policy (NEP).*

*To achieve these objectives, the Commission has conducted a review and amendment of Act 447 and Act 610 to identify weaknesses and shortcomings in the implementation or application of existing provisions.*

## Objektif Kajian Semula dan Cadangan Pindaan Akta *Objectives of the Review and Proposed Amendment of the Acts*



### **Membuat kajian semula dan cadangan pindaan kepada Akta 447 dan Akta 610.**

*Conduct a review and proposed amendments to Act 447 and Act 610.*



### **Mengenal pasti isu perundangan yang berbangkit, kelemahan dalam perundangan sedia ada dan perubahan keadaan semasa dalam pembangunan tenaga yang memerlukan pindaan atau cadangan untuk menetapkan dasar baharu kepada Akta 447 dan Akta 610.**

*Identify emerging legal issues, weaknesses in existing legislation, and current developments in the energy sector that require amendments or proposals to establish new policies under Act 447 and Act 610.*



### **Mewujudkan kerjasama bersama dengan pihak berkepentingan termasuk Kementerian, pembekal tenaga, pengguna serta pemain industri dalam melaksanakan kajian.**

*Establish collaboration with stakeholders, including the Ministry, energy suppliers, consumers and industry players, in conducting the review.*



### **Mewujudkan medium kerjasama dengan konsultan dalam hal perkara tertentu (jika perlu) sekiranya kajian memerlukan rundingan yang lebih terperinci.**

*Establish a collaboration platform with consultants for specific matters (if necessary) when the review requires more detailed consultations.*

Kumpulan Kerja Induk (KKI) dan 13 Kumpulan Kerja Kecil (KKK) telah ditubuhkan bagi melaksanakan kajian sepanjang 2022 bersama pihak pelaksana (dasar dan teknikal) iaitu ST, pihak Kementerian, pembekal tenaga, pengguna, pakar tenaga, perunding, penyelidik dan juga pemain industri.

KKK mengenal pasti isu-isu dasar, teknikal berserta perundangan, kelompangan atau hal-hal berkaitan yang dihadapi oleh pemain industri bekalan elektrik dalam penguatkuasaan dan pelaksanaan Akta 447 dan Akta 610 sedia ada.

Kajian yang dilaksanakan juga dijadikan platform untuk ST mendapatkan input dan pandangan yang menyeluruh berkenaan isu dan cabaran dalam penguatkuasaan dan pelaksanaan Akta 447 dan Akta 610 serta mengenal pasti cadangan-cadangan penambahbaikan.

Hasil kajian ini diguna pakai ST dalam mempertimbangkan keperluan untuk meminda Akta 447 dan Akta 610 sedia ada atau menggantikan perundangan berkenaan dengan Akta baharu.

*The Main Working Group (KKI) and 13 Sub-Working Groups (KKK) have been established to conduct the study throughout 2022 in collaboration with implementing parties (policy and technical) which consists of the Commission, the Ministry, energy suppliers, consumers, energy experts, consultants, researchers, and industry players.*

*The KKK identifies policy, technical, and legal issues, gaps, or related matters faced by electricity supply industry players in the enforcement and implementation of the existing Act 447 and Act 610.*

*The conducted study also serves as a platform for the Commission to obtain comprehensive input and perspectives on the issues and challenges in the enforcement and implementation of Act 447 and Act 610, as well as to identify suggestions for improvements.*

*The findings of this study are used by the Commission to consider the need for amending the existing Act 447 and Act 610, or replacing the legislation with a new Act.*

Laporan akhir kajian yang merangkumi isu-isu dasar dan perundangan yang berbangkit, cabaran industri yang dapat dikenal pasti dan beberapa penambahbaikan dan cadangan pindaan berkaitan akan dikemukakan kepada pihak Kementerian bagi penetapan dasar Kerajaan dan hala tuju seterusnya.

## **Pindaan kepada Peraturan-Peraturan Elektrik 1994, Peraturan-Peraturan Bekalan Pemegang Lesen 1990 dan Peraturan-Peraturan Bekalan Gas 1997**

Beberapa pindaan substantif telah dicadangkan melalui pengubalan kepada Peraturan-Peraturan Elektrik (Pindaan) 2022, Peraturan-Peraturan Bekalan Pemegang Lesen (Pindaan) 2022 dan Peraturan-Peraturan Bekalan Gas (Pindaan) 2022, bagi memastikan undang-undang pembekalan tenaga sentiasa ditambah baik dan dikemas kini mengikut peredaran masa dan perkembangan industri bekalan elektrik secara khususnya.

### **Peraturan-Peraturan Elektrik (Pindaan) 2022**

Beberapa siri bengkel diadakan bagi membincangkan cadangan pindaan kepada Peraturan-Peraturan Elektrik 1994 (PPE).

- **Bengkel PPE Dalaman ST pada 7-8 Jun 2022**
  - » Melibatkan wakil daripada Jabatan pelaksana dan pemunya proses ST bagi mendapatkan penjelasan dan maklum balas berhubung isu dasar dan teknikal yang berbangkit daripada pindaan yang dicadangkan kepada Peraturan-Peraturan.
- **Bengkel PPE ST dengan KeTSA pada 16-18 Jun 2022**
  - » Melibatkan wakil daripada Jabatan pelaksana, pemunya proses ST dan juga wakil KeTSA daripada Unit Undang-Undang dan Bahagian Regulatori dan Pembangunan Industri.
  - » Bertujuan untuk membentangkan cadangan pindaan kepada pihak Kementerian bagi mendapatkan kelulusan dasar sebelum Peraturan-Peraturan dapat dikemukakan kepada Bahagian Gubalan, Jabatan Peguam Negara untuk kelulusan sebelum dikuatkuasakan.

*The final study report, which covers the policy and legislative issues arising, identified industry challenges, and proposed improvements and amendment recommendations, will be presented to the Ministry for the determination of Government policies and future directions.*

## **Amendments to the Electricity Regulations 1994, the Licensee Supply Regulations 1990, and the Gas Supply Regulations 1997**

*Several substantive amendments have been proposed through the drafting of the Electricity (Amendment) Regulations Act 2022, the Licensee Supply (Amendment) Regulations Act 2022, and the Gas Supply (Amendment) Regulations Act 2022, to ensure continuous improvement and update of the energy supply laws in line with the current trends and developments in the electricity supply industry.*

### **Electricity (Amendment) Regulations 2022**

*A series of workshops were conducted to discuss proposed amendments to the Electricity Regulations 1994 (ER).*

- **The Commission's Internal Workshop on ER on 7-8 June 2022**
  - » *Involved representatives from the Commission's implementing departments and process owners to obtain clarification and feedback on policy and technical issues arising from the proposed amendments to the Regulations.*
- **The Commission's Workshop on ER with KeTSA on 16-18 June 2022**
  - » *Involved representatives from the Commission's implementing departments, process owners, and KeTSA's representatives from the Legal Unit and Regulatory and Industrial Development Division.*
  - » *Aimed to present the proposed amendments to the Ministry for policy approval before the Regulations can be submitted to the Drafting Division, Attorney General's Chambers, for approval prior to enforcement.*

- **Bengkel Pembentangan Cadangan Pindaan Peraturan-Peraturan Elektrik 1994 kepada Pihak Pengurusan Tertinggi ST pada 29 hingga 30 Julai 2022**

- » Diadakan bagi memberi penerangan dan memaklumkan kepada pihak Pengurusan Tertinggi ST berhubung pindaan yang dicadangkan dalam Peraturan-Peraturan.
- » Sesi ini juga diadakan bagi membentangkan intipati cadangan pindaan dalam Peraturan-Peraturan dan mendapatkan penjelasan lanjut (sekiranya perlu) daripada pegawai ST yang berkaitan khususnya yang melibatkan aspek teknikal dan dasar ST termasuklah memperhalusi dan menyelaraskan polisi serta pelaksanaan ST yang terkait dengan projek Transformasi Digital ST.

ST sedang menambah baik cadangan pindaan yang diperuntukkan dalam Peraturan-Peraturan Elektrik (Pindaan) 2022 bagi melaksanakan penambahbaikan yang lebih menyeluruh merangkumi kajian kemampuan kewangan ST yang melibatkan penambahbaikan fi sedia ada dan fi baharu.

### **Peraturan-Peraturan Bekalan Pemegang Lesen (Pindaan) 2022**

Beberapa sesi mesyuarat dan perbincangan telah diadakan bersama wakil daripada Jabatan pelaksana, pemunya proses ST dan juga wakil Kementerian daripada Unit Undang-Undang dan Bahagian Regulatori dan Pembangunan Industri bagi memperjelaskan pindaan yang dicadangkan dan membincangkan isu dasar dan teknikal yang berbangkit daripada pindaan yang dicadangkan kepada Peraturan-Peraturan tersebut.

Penggubalan kepada Peraturan-Peraturan Bekalan Pemegang Lesen (Pindaan) 2022 telah dilaksanakan dan diselesaikan sewajarnya oleh ST dan Peraturan-Peraturan tersebut di peringkat semakan Jabatan Peguam Negara untuk pewartaan sebelum dikuat kuasa.

- **Workshop on Presentation of Proposed Amendments to the Electricity Regulations 1994 to the Commission's Top Management on 29-30 July 2022**

- » *Conducted to provide explanations and inform the Commission's Top Management about the proposed amendments in the Regulations.*
- » *This session also aimed to present the key amendments in the Regulations and obtain further clarification (if necessary) from the Commission's relevant officials, particularly those involved in the Commission's technical and policy aspects, including reviewing and aligning policies and the Commission's implementation related to the Commission's Digital Transformation projects.*

*The Commission is enhancing the proposed amendments outlined in the Electrical (Amendment) Regulations 2022 to implement more comprehensive improvements, including a study on the Commission's financial sustainability involving enhancing existing fees and introducing new fees.*

### **Licensee Supply (Amendment) Regulations 2022**

*Several meetings and discussions have been conducted with representatives from the implementing departments, the Commission's process owners, and Ministry representatives from the Legal Unit and Regulatory and Industrial Development Division to clarify the proposed amendments and discuss the policy and technical issues arising from the proposed amendments to the Regulations.*

*The drafting of the Licensee Supply (Amendment) Regulations 2022 has been implemented and completed by the Commission, and the Regulations are currently undergoing review by the Attorney General's Chambers for gazetting before enforcement.*



## Peraturan-Peraturan Bekalan Gas (Pindaan) 2022

Beberapa sesi mesyuarat dan perbincangan telah diadakan bersama dengan Penasihat Undang-Undang, Unit Perancang Ekonomi (EPU) Jabatan Perdana Menteri, Penasihat Undang-Undang Jabatan Perdana Menteri dan juga pihak Bahagian Gubalan, Jabatan Peguam Negara bagi memperjelaskan pindaan yang dicadangkan dan membincangkan isu dasar dan teknikal yang berbangkit daripada pindaan yang dicadangkan kepada Peraturan-Peraturan tersebut.

Penggubalan kepada Peraturan-Peraturan Bekalan Gas (Pindaan) 2022 telah dilaksanakan dan diselesaikan sewajarnya oleh ST dan Peraturan-Peraturan tersebut di peringkat semakan Jabatan Peguam Negara untuk pewartaan sebelum dikuat kuasa.

## Rang Undang-Undang Kecekapan dan Konservasi Tenaga 2022

Penggubalan undang-undang ini adalah bagi memperuntukkan pengawalseliaan terhadap penggunaan tenaga secara cekap dan konservasinya untuk menambah baik dan meningkatkan kecekapan tenaga serta mengelakkan pembaziran tenaga.

Beberapa siri bengkel telah diadakan bagi memuktamadkan semakan dasar dan perundangan bagi Rang Undang-Undang bersama pihak Kementerian dan Bahagian Gubalan, Jabatan Peguam Negara.

Penggubalan ini telah dilaksanakan dan diselesaikan sewajarnya oleh ST dan kini di peringkat semakan Jabatan Peguam Negara dan dijangka akan dibentangkan di Parlimen pada 2023.

## Gas Supply (Amendment) Regulations 2022

*Several meetings and discussions have been held with the Legal Advisor, Economic Planning Unit (EPU) of the Prime Minister's Department, Legal Advisor of the Prime Minister's Department, and the Drafting Division of the Attorney General's Chambers to clarify the proposed amendments and discuss the policy and technical issues arising from the proposed amendments to the Regulations.*

*The drafting of the Gas Supply (Amendment) Regulations 2022 has been implemented and completed by the Commission, and the Regulations are undergoing review by the Attorney General's Chambers for gazetting before enforcement.*

## Energy Efficiency and Conservation Bill 2022

*The drafting of this law aims to provide regulation on the efficient use and conservation of energy to improve energy efficiency and prevent energy wastage.*

*Several workshops have been conducted to finalise the policy and legislative review for the Energy Efficiency and Conservation Bill together with the Ministry and the Drafting Division of the Attorney General's Chambers.*

*The drafting process has been appropriately completed by the Commission and is undergoing review by the Attorney General's Chambers. It is expected to be presented in Parliament in 2023.*





## Pengemaskinian Polisi, Pekeliling, Prosedur dan Panduan Dalaman ST

### *Update Of The Commission's Internal Policies, Directives, Procedures and Guidelines*

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#### **Pembangunan Prosedur Penubuhan Jawatankuasa, Jawatankuasa Pentadbiran dan Kumpulan Kerja**

Bagi memastikan penubuhan Jawatankuasa di bawah ST adalah berpandukan kepada kehendak perundangan di bawah Akta Suruhanjaya Tenaga, tatacara, prosedur serta rekod senarai Jawatankuasa yang lengkap secara berpusat diperkenalkan bagi memastikan tiada pertindihan skop dan kuasa bagi setiap fungsi sesebuah Jawatankuasa dan Kumpulan Kerja.

Dalam usaha meningkatkan pemahaman warga kerja berkaitan pematuhan dasar baharu ini, sesi *ST Lecture Series* telah dijalankan pada 15 Disember 2022 untuk menjelaskan cara kerja baharu serta membuka ruang untuk sesi maklum balas.

Prosedur Penubuhan Jawatankuasa, Jawatankuasa Pentadbiran dan Kumpulan Kerja akan dipantau dari semasa ke semasa bagi memastikan senarai pendaftaran yang sistematik dan tepat.

#### ***Development of Procedures for Establishing Committees, Administrative Committees, and Work Groups***

*To ensure the establishment of committees under the Commission comply with the requirements under the Energy Commission Act, orders, procedures, and centralised records of complete committee lists have been introduced to ensure no overlap of scope and authority for each Committee and Work Group.*

*In an effort to enhance employees' understanding of compliance with these new policies, a Commission Lecture Series session was conducted on December 15, 2022, to discuss the new working procedures and provide an opportunity for feedback.*

*The procedures for establishing committees, administrative committees, and workgroups will be periodically monitored to ensure systematic and accurate registration lists.*

## Inisiatif Meningkatkan Pematuhan

### ***Initiatives to Enhance Compliance***

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Bagi meningkatkan tahap pematuhan terhadap syarat dan keperluan ST, Unit Pematuhan ditubuhkan pada 2021 untuk melaksanakan inisiatif pematuhan strategik dengan pemegang taruh yang berkaitan. Inisiatif ini diharap dapat mengurangkan jurang ketidakpatuhan pemegang taruh terhadap Akta Bekalan Elektrik dan Akta Bekalan Gas.

Syarat dan keperluan ST juga diberikan penekanan melalui hebahan yang sewajarnya di mana inisiatif ini telah mewujudkan peluang kerjasama strategik di kalangan pemegang taruh.

*To enhance compliance with the Commission's requirements and regulations, a Compliance Unit was established in 2021 to implement strategic compliance initiatives with relevant stakeholders. These initiatives aim to reduce the compliance gap among stakeholders in relation to the Electricity Supply Act and the Gas Supply Act.*

*The requirements and regulations of the Commission have also been emphasised through appropriate dissemination, creating opportunities for strategic collaborations among stakeholders.*

Selain itu, input daripada skop pematuhan juga dapat mengurangkan karenah birokrasi melalui pengharmonian proses dalaman di bawah Projek Transformasi Digital ST.

Furthermore, input from the compliance scope can help reduce bureaucratic processes through the streamlining of internal processes under the Commission's Digital Transformation Project.

**Program Peningkatan Pematuhan, 2022**  
*Programmes to Enhance Compliance, 2022*

<b>Program dan Sesi Libat Urus</b> <i>Programmes and Engagement Sessions</i>	<b>Keterangan</b> <i>Description</i>
<b>Program Pemutihan Pemasangan 11 kV</b> <i>11 kV Installation Legalisation Programme</i>	Beberapa pemasangan yang didapati tidak memenuhi syarat pematuhan telah diambil tindakan susulan. <i>Appropriate actions have been taken against several non-compliant installations.</i>
<b>Luncheon with CEO</b> <i>Luncheon with CEO</i>	Program memperkasakan peranan Jurutera Pelawat dan memupuk kesedaran tentang kepentingan tanggungjawab Jurutera Pelawat bagi meningkatkan tahap pematuhan dan keselamatan elektrik. <i>Programme to empower the role of Visiting Engineers and to promote awareness about the importance of the responsibilities of Visiting Engineers to enhance compliance and electrical safety.</i>
<b>Projek Transformasi Digital ST</b> <i>The Commission's Digital Transformation Project</i>	Menambah baik sistem perkhidmatan dalam talian bagi memudahkan pengguna dalaman dan pemegang taruh ST. <i>Improved the online service system to facilitate the Commission's internal users and stakeholders.</i>
<b>Sesi libat urus bersama</b> <i>Engagement sessions with</i> <ul style="list-style-type: none"> <li>• Jabatan Kerajaan Tempatan, Kementerian Pembangunan Kerajaan Tempatan (KPKT) <i>Local Government Departments, Ministry of Local Government Development (KPKT)</i></li> <li>• TNB, PETRONAS dan Lembaga Pembangunan Industri Pembinaan (CIDB) <i>TNB, PETRONAS, and Construction Industry Development Board (CIDB)</i></li> <li>• Persatuan Insurans Am Malaysia (PIAM) <i>General Insurance Association of Malaysia (PIAM)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Mendapat persetujuan KPKT untuk mengambil kira syarat dan keperluan ST untuk kelulusan bagi cadangan projek yang dimohon melalui One Stop Center (OSC) Online KPKT. <i>Obtained approval from KPKT to consider the Commission's requirements and regulations for approval of proposed projects through KPKT's One Stop Center (OSC) Online.</i></li> <li>• Beberapa siri mesyuarat, dialog dan lawatan tapak telah diadakan dengan TNB dan PETRONAS, manakala CIDB bersetuju untuk bekerjasama dalam pendaftaran kontraktor untuk tujuan penguatkuasaan. <i>Conducted a series of meetings, dialogues, and site visits with TNB and PETRONAS, while CIDB agreed to collaborate in the registration of contractors for enforcement purpose.</i></li> <li>• Mendapat persetujuan PIAM untuk mengambil kira keperluan ST dalam menaja jamin polisi insurans bagi syarikat-syarikat insurans di bawah naungannya. <i>Obtained PIAM's approval to incorporate the Commission's requirements in underwriting insurance policies for companies under its purview.</i></li> </ul>

# Inisiatif Integriti dan Audit Dalaman

## *Integrity and Internal Audit Initiatives*

### **Pemantapan Nilai-nilai Integriti**

Bagi memperkukuhkan lagi fungsi integriti di ST, Pelan Antirasuah Organisasi (OACP) ST telah dilancarkan oleh KPE ST pada 18 Februari 2022.

Untuk keberkesanan pelaksanaan OACP tersebut, pada 2022, audit integriti telah dijalankan di lima (5) Jabatan di ST. Majlis Ikrar Bebas Rasuah juga dilaksanakan di empat (4) Pejabat Kawasan ST dengan kehadiran pegawai tertinggi dari Suruhanjaya Pencegahan Rasuah Malaysia (SPRM) Negeri sebagai saksi majlis. Bagi mempertingkatkan budaya kerja yang bermutu, beberapa ceramah integriti dan bebas rasuah juga telah dijalankan.

Pada 2022, ST menerima enam (6) aduan integriti di mana proses pengesanan, pengesahan dan laporan Ketua Unit Integriti telah dibentangkan kepada Jawatankuasa Integriti untuk tindakan.

### **Aktiviti Pengauditan Dalaman**

Untuk 2022, ST telah melaksanakan lapan (8) aktiviti audit dalaman, hasil daripada tujuh (7) operasi audit di Pejabat Kawasan dan satu (1) audit ISMS 27001. Hasil audit mendapati kawalan dalaman berada pada tahap yang memuaskan bagi mengurangkan risiko-risiko yang dikenal pasti, serta beroperasi secara efektif dalam melindungi kepentingan ST.

Kesemua penemuan audit berserta maklum balas dan cadangan penambahbaikan dibentangkan kepada Ahli Jawatankuasa Audit yang telah bersidang sebanyak empat (4) kali.

### ***Strengthening Integrity Values***

*To reinforce the structural integrity of the Commission, the Organisational Anti-Corruption Plan (OACP) was launched by the Commission's CEO on 18 February 2022.*

*To ensure the effective implementation of the OACP, integrity audits were conducted in five (5) Departments within the Commission in 2022. A Corruption-Free Pledge Ceremony was also held in four (4) of the Commission's Regional Offices, with the presence of senior officials from the Malaysian Anti-Corruption Commission (MACC) as witnesses. To promote a culture of quality work, several integrity and anti-corruption lectures were also conducted.*

*In 2022, the Commission received six (6) integrity complaints, and the process of detection, verification, and reporting by the Head of the Integrity Unit was presented to the Integrity Committee for further action.*

### ***Internal Auditing Activities***

*In 2022, the Commission conducted eight (8) internal audits, which resulted from seven (7) operational audits at the Commission's Regional Offices and one (1) ISMS 27001 audit. The audits found that internal controls were satisfactory in mitigating identified risks and effectively operating to protect the Commission's interests.*

*All audit findings, feedback, and improvement recommendations were presented to the Audit Committee, which convened four (4) times for review and discussion.*

# Kerjasama Strategik dan Libat Urus Bersama Pemegang Taruh

## *Strategic Cooperation and Engagement with Stakeholders*

Pelbagai bentuk kerjasama strategik dan aktiviti libat urus dilaksanakan sepanjang 2022, termasuk siri taklimat dan penerangan isu-isu berkaitan tarif elektrik, sesi kupasan idea mengenai kajian dan penyelidikan, lawatan kerja saintifik, penganjuran sidang kemuncak tenaga belia di samping menjadi tuan rumah bagi lawatan kerja delegasi luar negara.

Pertukaran maklumat dan amalan kawal selia antara ST dan badan kawal selia tenaga luar negara khususnya Brunei Darussalam dilaksanakan bagi meningkatkan keberkesanan infrastruktur kawal selia sektor tenaga di negara masing-masing. Antara amalan-amalan baik regulatori yang telah dikongsikan adalah mengenai pembangunan sumber manusia dan kemahiran dalam sektor tenaga, pembangunan Orang Kompeten dan konsep *Centre of Excellence* (CoC). Lawatan kerja ST ke Energy Market Authority (EMA) Singapura pula mendedahkan ST mengenai pelan peralihan tenaga ke arah penyahkarbonan, penggunaan sistem penyimpanan tenaga (ESS) untuk solar dan pendekatan kawal selia ESS oleh EMA.

Kupasan mengenai kajian dan penyelidikan dalam bidang ekonomi tenaga turut dilaksanakan ST bersama pemegang taruh dari kalangan penyelidik universiti khususnya Universiti Tenaga Nasional (UNITEN) dan agensi kerajaan lain. Penglibatan pemegang taruh dalam bidang penyelidikan tidak terhad kepada penyelidik universiti bahkan turut disertai oleh pegawai-pegawai ST yang menyertai program pasca siswazah.

Selain itu, ST juga menganjurkan seminar dan bengkel melibatkan peserta dalam dan luar negara khususnya dalam bidang keselamatan, tenaga boleh baharu (TBB), tenaga bersih, kecekapan tenaga dan teknologi *Battery Energy Storage System* (BESS). Ini termasuklah kerjasama penganjuran dengan ASEAN, ASEAN +3 dan juga US Department of State.

*Throughout 2022, various forms of strategic cooperation and engagement activities were implemented, including briefing sessions and discussions on electricity tariff issues, idea generation sessions on studies and research, scientific field visits, organising youth energy summits, as well as hosting international delegations.*

*Information and regulatory practices exchange between the Commission and foreign energy regulatory bodies, particularly Brunei Darussalam, were carried out to enhance the effectiveness of the energy sector regulatory infrastructure in each respective country. Some of the shared regulatory best practices include human resource development and skills in the energy sector, the development of Competent Person, and the concept of a Centre of Excellence (CoC). The Commission's working visit to the Energy Market Authority (EMA) of Singapore exposed the Commission to their energy transition plans towards decarbonisation, the use of energy storage systems (ESS) for solar, and EMA's regulatory approach to ESS.*

*The Commission also conducted discussions on energy economics research and studies in collaboration with stakeholders, including researchers from universities, specifically Universiti Tenaga Nasional (UNITEN) and other government agencies. The involvement of stakeholders in research is not limited to university researchers but also includes the Commission's officers participating in postgraduate programmes.*

*Furthermore, the Commission organised seminars and workshops involving local and international participants, particularly in the areas of safety, renewable energy (RE), clean energy, energy efficiency, and Battery Energy Storage System (BESS) technology. This includes co-organising events with ASEAN, ASEAN +3, and the US Department of State.*

## Senarai Kerjasama Strategik dan Libat Urus, 2022 *List of Strategic Cooperation and Engagement, 2022*

Bil. No.	Butiran Details	Tarikh Date
1	Taklimat Cadangan Pelarasan Tarif Elektrik di Semenanjung di bawah Mekanisme <i>Imbalance Cost Pass-Through</i> (ICPT) bagi Tempoh 1 Julai hingga 31 Disember 2022 <i>Briefing on Proposed Electricity Tariff Adjustment in the Peninsula under the Imbalance Cost Pass-Through (ICPT) Mechanism for the Period of 1 July to 31 December 2022</i>	10 Jan 2022 10 Jan 2022
2	<i>Incentive-Based Regulation (IBR) &amp; ICPT Comms Briefing to Communication Control Command Centre (CCCC), Kementerian Komunikasi dan Multimedia</i> <i>Incentive-Based Regulation (IBR) &amp; ICPT Comms Briefing to Communication Control Command Centre (CCCC), Ministry of Communications and Multimedia</i>	13 Jan 2022 13 Jan 2022
3	Sesi taklimat kepada SME Association of Malaysia: <i>Update on government initiative towards sustainable energy for commercial &amp; industry sectors</i> <i>Briefing session to SME Association of Malaysia: Update on government initiative towards sustainable energy for commercial &amp; industry sectors</i>	27 Jan 2022 27 Jan 2022
4	Taklimat mengenai Tarif Elektrik bagi Pengguna-Pengguna di Semenanjung kepada FOMCA <i>Briefing on Electricity Tariff for Consumers in the Peninsula to FOMCA</i>	3 Feb 2022 3 Feb 2022
5	Forum Serantau: <i>The 3<sup>rd</sup> Government-Private Forum on the Cleaner Energy Future Initiative for ASEAN (CEFIA) dan The 16<sup>th</sup> ASEAN+3 New and Renewable Energy (NRE) &amp; Energy Efficiency and Conservation (EE&amp;C) Forum Regional Forum: The 3<sup>rd</sup> Government-Private Forum on the Cleaner Energy Future Initiative for ASEAN (CEFIA) and The 16<sup>th</sup> ASEAN+3 New And Renewable Energy (NRE) &amp; Energy Efficiency And Conservation (EE&amp;C) Forum</i>	21 & 22 Feb 2022 21 & 22 Feb 2022
6	Bengkel " <i>Project Ideation</i> " Kursi Ekonomi Tenaga <i>Kursi Ekonomi Tenaga Project Ideation Workshop</i>	25 Feb 2022 25 Feb 2022
7	Lawatan kerja ST ke EMA, Singapura <i>The Commission's working visit to EMA, Singapore</i>	13 Mei 2022 13 May 2022
8	Kerjasama penyelidikan dengan <i>New Energy and Industrial Technology Development Organisation (NEDO)</i> , temu bual dan lawatan tapak <i>Research collaboration with New Energy and Industrial Technology Development Organization (NEDO), including interviews and site visits</i>	30 Mei 2022 30 May 2022
9	Lawatan Kerja Delegasi Kerajaan Republik Botswana ke ST <i>Working Visit of the Republic of Botswana Delegation to the Commission</i>	30 Mei 2022 30 May 2022
10	Seminar Keselamatan Sistem Gas Berpaip 2022, Zon Pantai Timur Semenanjung <i>Gas Pipeline System Safety Seminar 2022, the Peninsula East Coast Zone</i>	2 Jun 2022 2 Jun 2022
11	Lawatan Kerja Autoriti Elektrik Negara Brunei Darussalam (AENBD) ke ST <i>Working Visit of the Autoriti Elektrik Negara Brunei Darussalam (AENBD) to the Commission</i>	27 - 30 Jun 2022 27 - 30 Jun 2022
12	Kerjasama ST dengan UNITEN bagi penganjuran <i>Youth Energy Summit 2022</i> <i>The Commission's collaboration with UNITEN for the organisation of the Youth Energy Summit 2022</i>	1 Okt - 13 Nov 2022 1 - 13 Oct 2022
13	<i>US Department of State-ST, Malaysia Workshop on Battery Energy Storage Systems</i> <i>US Department of State-ST, Malaysia Workshop on Battery Energy Storage Systems</i>	19 - 20 Okt 2023 19 - 20 Oct 2022

## Hab Maklumat Tenaga Malaysia (MEIH) Sebagai Sumber Rujukan Industri

### *Malaysia Energy Information Hub (MEIH) as the Industry Source of Reference*

Projek penambahbaikan portal MEIH dan aplikasi mudah alih *MyEnergyStats* dilaksanakan agar selari dengan perkembangan teknologi terkini. Pada 2022, sesi pengumpulan data giat dijalankan khususnya bersama pembekal data, penggubal dasar, penyelidik dan pertubuhan bukan kerajaan (NGO) bagi mengenal pasti keperluan data dan pelaporan yang tepat.

*The enhancement project for the MEIH portal and the MyEnergyStats mobile application is carried out to align with the latest technological advancements. In 2022, data collection sessions were actively conducted, particularly in collaboration with data providers, policymakers, researchers, and non-governmental organisations (NGOs), to identify accurate data and reporting needs.*



Portal baharu MEIH disasarkan untuk dilancarkan pada 2025.

Analisis data tenaga yang komprehensif dan tepat dari portal dan aplikasi tersebut dapat diguna pakai dalam perancangan dan pembentukan landskap masa hadapan tenaga negara. Selain itu, pengumpulan data secara berpusat dan sistematik ini juga merupakan penanda aras bagi negara-negara lain untuk amalan yang sama.

*The launch of the new MEIH portal is targeted for 2025.*

*The comprehensive and precise energy data analysis from the portal and application can be utilised in planning and shaping the country's future energy landscape. Moreover, this centralised and systematic data collection also serves as a benchmark for other countries to adopt similar practices.*

## Audit Pemantauan Kedua ISO 9001:2015

### Second Surveillance Audit ISO 9001:2015

Bagi menambah baik Sistem Pengurusan Kualiti (SPK) ST dan memastikan proses kerja di ST memenuhi keperluan standard ISO 9001:2015, audit pemantauan telah dijalankan pada 8-18 Februari 2022.

Audit Pemantauan Kedua ISO 9001:2015 ini dijalankan di Ibu Pejabat dan tiga (3) Pejabat Kawasan (Johor, Kelantan & Terengganu dan Perak). Hasil audit tersebut, pada Februari 2022, ST berjaya menerima Pensijilan bagi Audit Pemantauan Kedua ISO 9001:2015 dari *Lloyds Register Quality Assurance* (LRQA).

Kejayaan Penerimaan Pensijilan bagi Audit Pemantauan Kedua ISO 9001:2015 ini menunjukkan SPK di ST telah mengikuti pendekatan yang diiktiraf di peringkat global, yang tertumpu kepada penambahbaikan proses yang berterusan serta pengurusan risiko untuk memenuhi keperluan dan kehendakpihak-pihakberkepentingan.

*To enhance the Commission's Quality Management System (QMS) and ensure the Commission's work processes meet the requirements of the ISO 9001:2015 standard, the first surveillance audit was conducted from 8 - 18 February 2022.*

*The second surveillance audit of ISO 9001:2015 was carried out at the Headquarters and three (3) Regional Offices (Johor, Kelantan & Terengganu, and Perak). The audit enabled the Commission to receive the Certificate for Second Surveillance Audit ISO 9001:2015 from Lloyd's Register Quality Assurance (LRQA) in February 2022.*

*The success of attaining the Certificate for Second Surveillance Audit ISO 9001:2015 indicates that the Commission's QMS has followed a globally recognised approach, with a focus on continuous process improvement and risk management to meet the requirements and expectations of stakeholders.*

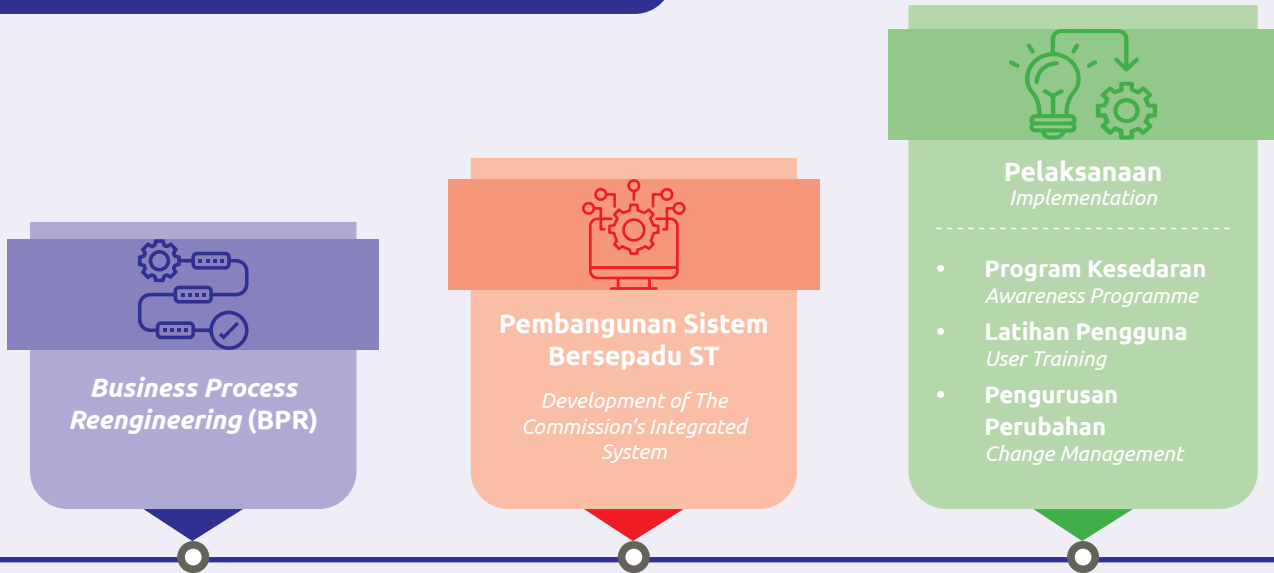
# Sorotan Utama

## Main Highlights

### Pelaksanaan Projek Transformasi Digital

### Implementation of the Digital Transformation Project

#### Fasa Transformasi Digital ST The Commission's Digital Transformation Phase



Projek Transformasi Digital ST bertujuan meningkatkan prestasi penyampaian perkhidmatan sistem dalam talian untuk pemegang taruh ST. Hasil kajian BPR telah digunakan untuk menyediakan Spesifikasi Keperluan Pengguna (URS) bagi pembangunan Sistem Bersepadu ST yang baharu.

Sepanjang 2022, aktiviti URS telah dimulakan dengan memberi tumpuan kepada keperluan Sistem Bersepadu ST yang akan menggantikan sistem *Energy Commission Online System (ECOS)* dan *Online Application System (OAS)* ST.

Penyediaan URS ini adalah berdasarkan proses baharu hasil kajian BPR dengan matlamat utamanya adalah penyampaian perkhidmatan dalam talian di ST secara *end-to-end process*.

*The Commission's Digital Transformation Project is aimed at improving the performance of online service delivery for the Commission's stakeholders. The results of the BPR study have been utilised to develop User Requirement Specifications (URS) for the Commission's new Integrated System.*

*Throughout 2022, URS activities have commenced, focusing on the requirements of the Integrated ST System that will replace the Energy Commission Online System (ECOS) and the Commission's Online Application System (OAS).*

*The preparation of URS is based on the new processes identified through the BPR study, with the primary goal of enabling the Commission's end-to-end online service delivery.*

## Penyertaan ST dalam Mesyuarat Menteri-Menteri Asean Mengenai Tenaga (AMEM), Mesyuarat Pegawai-Pegawai Kanan Asean Mengenai Tenaga (SOME) dan Mesyuarat Kumpulan Kerja di bawah Asean

Menteri-Menteri Tenaga ASEAN meneruskan komitmen negara masing-masing dalam melaksanakan inisiatif peralihan tenaga ke arah neutral karbon. Antara fokus utama yang dibincangkan adalah mengenai 7th ASEAN Energy Outlook, memorandum persefahaman (MOU) antara ASEAN-International Renewable Energy Agency (IRENA), cadangan-cadangan dari World Energy Transition Outlook: Outlook 2022 serta analisis dan penemuan oleh IRENA mengenai peluang meningkatkan penggunaan biomass bagi tujuan peralihan tenaga.

Selain itu perkara-perkara lain yang turut dibincangkan adalah berkaitan ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 Fasa II: 2021-2025, yang antara lain termasuk mengenai arang batu dan teknologi arang batu bersih, kecekapan tenaga dan pemuliharaan, TBB, dasar dan perancangan tenaga serantau serta tenaga nuklear awam.

Melalui penyertaan dalam mesyuarat-mesyuarat ini, ST dapat terus memainkan peranan sebagai Pengerusi bagi mesyuarat membincangkan arang batu dan teknologi arang batu bersih, selain sebagai titik fokus dalam isu-isu berkaitan kecekapan tenaga dan ASEAN Energy Regulatory Network (AERN).

## *The Commission's Participation in the ASEAN Minister's Meetings on Energy (AMEM), the ASEAN Senior Officials' Meetings on Energy (SOME), and the Working Group Meeting under ASEAN*

*The ASEAN Energy Ministers continue their respective countries' commitment to implementing energy transition initiatives towards carbon neutrality. Among the main focuses discussed are the 7th ASEAN Energy Outlook, the memorandum of understanding (MoU) between ASEAN and the International Renewable Energy Agency (IRENA), proposals from the World Energy Transition Outlook: Outlook 2022, as well as IRENA's analysis and findings on opportunities to enhance biomass utilisation for energy transition purposes.*

*Furthermore, other matters discussed are related to the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 Phase II: 2021-2025, covering topics such as coal and clean coal technologies, energy efficiency and conservation, RE, regional energy policy and planning and public nuclear energy.*

*Through participation in these meetings, the Commission continues to play a role as the Chair in discussions on coal and clean coal technology, as well as a focal point in energy efficiency and the ASEAN Energy Regulatory Network (AERN) issues.*

# 7. PEMBANGUNAN KAPASITI DAN KEUPAYAAN

## *CAPACITY AND CAPABILITY BUILDING*

- 193 **PENGUKUHAN KAPASITI TENAGA KERJA**  
*STRENGTHENING THE WORKFORCE CAPACITY*
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*MAIN HIGHLIGHTS*



# Penguatan Kapasiti Tenaga Kerja

## Strengthening the Workforce Capacity

Dalam mengharungi era pascapandemik, kekuatan dan pembangunan tenaga kerja menjadi salah satu keutamaan ST dalam memastikan organisasi kekal berupaya memenuhi ekspektasi semua pihak berkepentingan.

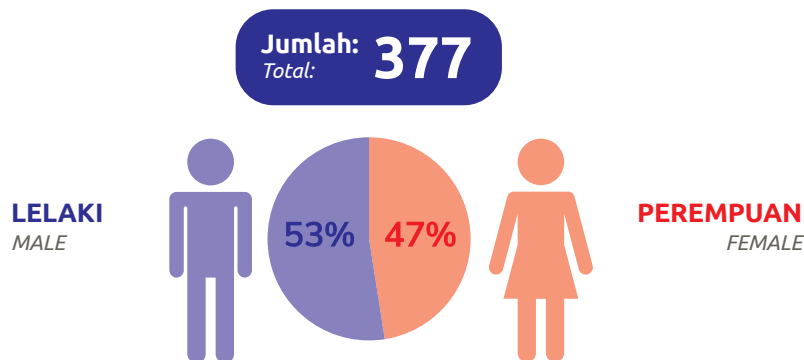
Sepanjang 2022, fokus diteruskan untuk membentuk organisasi agar lebih tangkas terhadap perubahan-perubahan terkini industri tenaga serta isu global semasa. Bagi memenuhi keperluan tenaga kerja ST ke arah penyampaian perkhidmatan yang efektif, cekap dan berintegriti, tambahan sebanyak 5% kakitangan baharu dari pelbagai bidang dan disiplin telah dilaksanakan.

Khidmat Pakar Teknikal dari industri tenaga juga ditambah pada 2022 bagi membantu ST membuat keputusan terbaik dan memberikan khidmat nasihat yang tepat serta terperinci demi pembangunan sektor tenaga negara.

*In navigating the post-pandemic era, the strength and development of the workforce have become one of the Commission's priorities in ensuring that the organisation remains capable of meeting the expectations of all stakeholders.*

*Throughout 2022, the focus continued to be on shaping the organisation to be more agile in response to current changes in the energy industry and global issues. To meet the Commission's workforce needs towards delivering effective, efficient, and integrity-driven services, an additional 5% of new staff from various fields and disciplines has been hired.*

*Technical Expertise services from the energy industry were also added in 2022 to assist the Commission in making the best decisions and providing precise and detailed advice for the development of the nation's energy sector.*



Pada 2022, ST mempunyai seramai 377 warga kerja yang terdiri dari 53% lelaki dan 47% wanita.

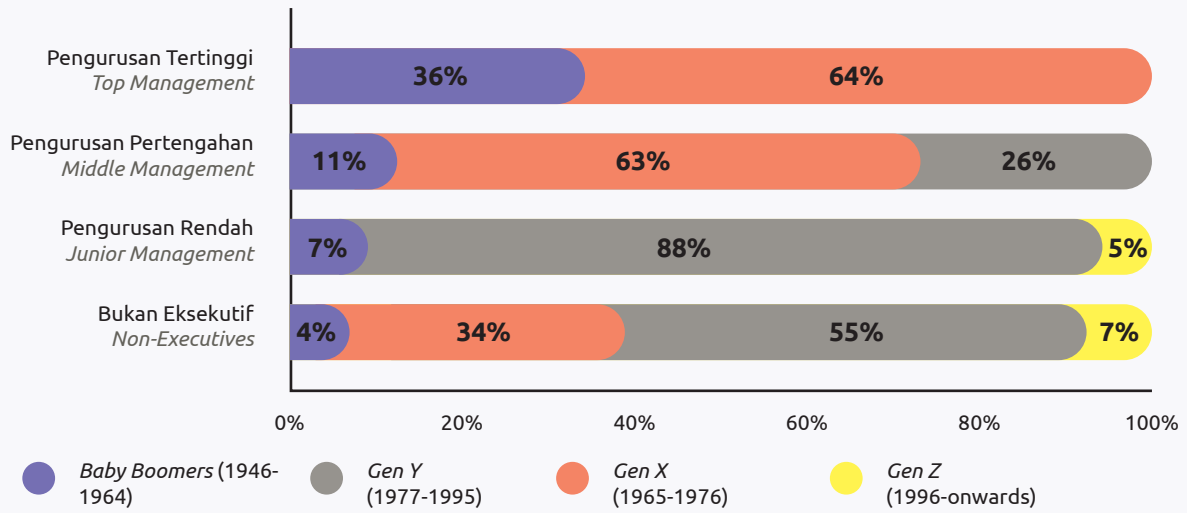
Komposisi kakitangan wanita yang memegang jawatan di peringkat pengurusan adalah sebanyak 46%, hampir seimbang dengan jumlah kakitangan lelaki, selaras dengan penggalakkan penglibatan kaum wanita dalam membuat keputusan untuk ST.

*In 2022, the Commission had a total of 377 employees, comprising 53% male and 47% female.*

*The composition of female staff in management positions was 46%, which balanced the number of male employees, in line with the Commission's encouragement of female involvement in decision-making.*



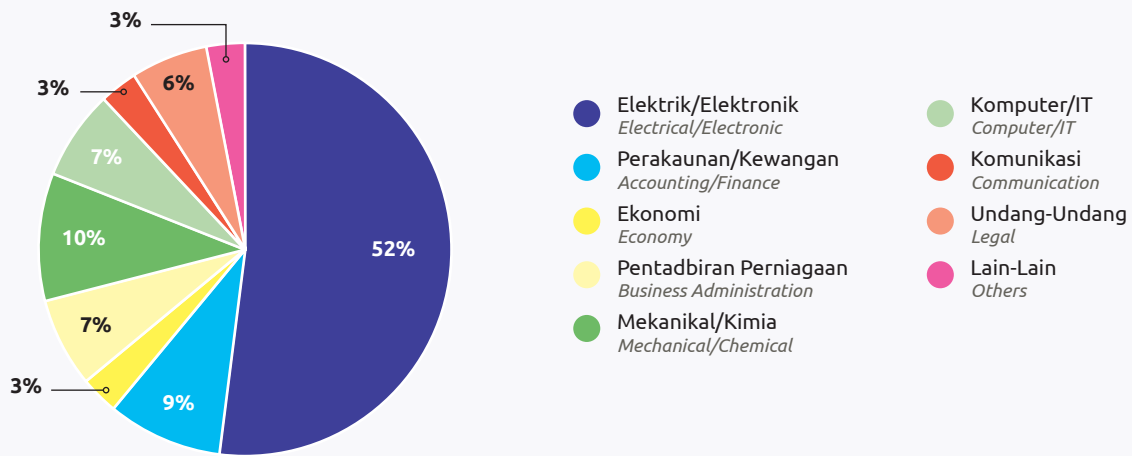
**Pembahagian Warga Kerja Mengikut Segmen, 2022**  
*Distribution of Workforce by Segments, 2022*



Golongan *Millennials* merupakan kumpulan terbesar tenaga kerja ST dan purata umur kakitangan ST adalah pada umur 40.5 tahun. Ini bermaksud, ST mempunyai kapasiti warga kerja yang bertenaga, beraspirasi, berfikiran terbuka dan mudah beradaptasi dengan sebarang perubahan. Ciri-ciri tersebut amat diperlukan bagi memastikan ST terus relevan dan selari dengan tuntutan dan cabaran semasa industri tenaga.

*Millennials represent the largest group of the Commission's workforce, and the average age of the Commission's employees is 40.5 years. This means the Commission has a workforce who are energetic, aspired, open-minded, and adaptable to changes. These characteristics are critical to ensure that the Commission remains relevant and aligned with the demands and current challenges of the energy industry.*

**Latar Belakang Profesional Warga Kerja**  
*Professional Background of Employees*



Bagi pelaksanaan fungsi kawal selia teknikal dan keselamatan, ST mengekalkan peratusan kakitangan terbesar (62%) dalam bidang Kejuruteraan Elektrik/Elektronik dan juga Kejuruteraan Mekanikal/Kimia. Selain itu, ST juga mempunyai peratusan kakitangan dengan latar belakang bidang Ekonomi/Kewangan sebanyak 11% bagi tujuan kawal selia ekonomi industri tenaga, serta jurusan Undang-Undang bagi tujuan kawal selia penguatkuasaan undang-undang bekalan elektrik dan gas.

ST turut membantu warga kerjanya untuk kekal mengharungi cabaran pemulihan dari fasa pandemik melalui beberapa inisiatif tambahan seperti Kebenaran Bekerja Dari Rumah bagi kakitangan yang perlu menjaga ahli keluarga yang dikuarantin akibat jangkitan influenza atau penyakit-penyakit berjangkit yang lain. Selain membekalkan kit ujian COVID-19 dan bekalan topeng muka secukupnya kepada semua kakitangan, ST turut membiayai sepenuhnya bayaran ujian PCR COVID-19 dan ujian Influenza H1N1 bagi semua kakitangan dan ahli keluarga mereka. Sokongan dari segi mental juga diberikan dengan mengadakan beberapa sesi ceramah kesihatan mental oleh doktor pakar psikologi serta mengadakan sesi bacaan surah Yassin secara berkala, sebagai usaha meningkatkan semangat dan spiritual kakitangan yang kehilangan ahli keluarga serta rakan-rakan semasa pandemik.

*For the implementation of technical and safety regulation functions, the Commission maintains the largest percentage of employees (62%) in the fields of Electrical/Electronic Engineering and Mechanical/Chemical Engineering. In addition, the Commission also has a percentage of employees with backgrounds in Economics/Finance (11%) to regulate the economic aspects of the energy industry, as well as Law majors to regulate the enforcement of laws related to electricity and gas supply.*

*The Commission also assists its employees to remain steadfast in facing post-pandemic challenges through several additional initiatives. This includes providing Work-from-Home alternative for employees who need to care for quarantined family members due to influenza or other infectious diseases. Aside from supplying COVID-19 testing kits and an adequate supply of face masks to all employees, the Commission fully covers the cost of PCR COVID-19 tests and H1N1 Influenza tests for all employees and their family members. Mental health support was also provided by organising a number of mental health talks by psychologists and conducting regular recitation sessions of Surah Yassin to uplift the spirits and improve the spiritual well-being of employees who have lost family members or colleagues during the pandemic.*



## Penguatan Keupayaan Kakitangan

### *Strengthening the Employee Capability*

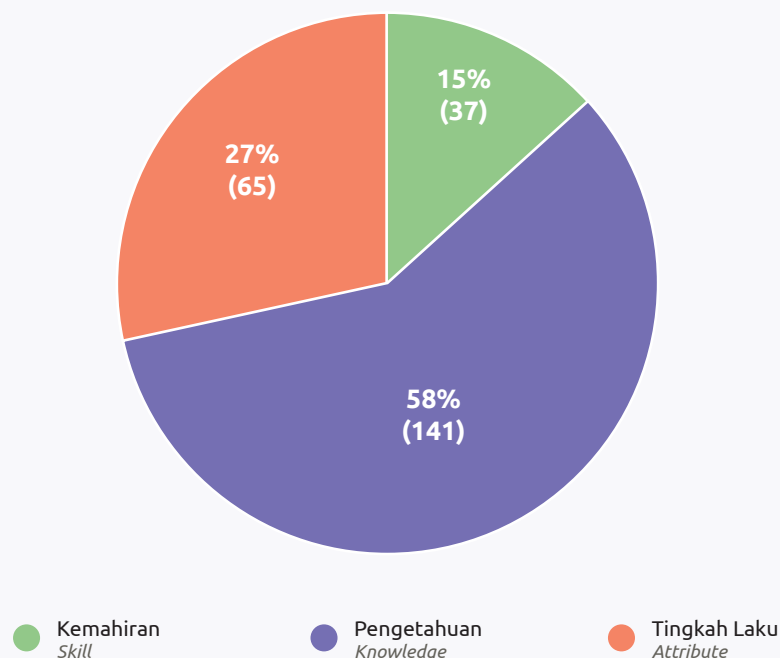
Bagi memastikan ST sentiasa seiring dengan peredaran arus deras industri tenaga, kakitangan ST terus dibangunkan dengan pengetahuan terkini dan kemahiran dalam bidang-bidang baharu seperti *battery storage*, hidrogen, serta teknologi-teknologi terkini dalam bidang kecekapan tenaga dan tenaga boleh baharu (TBB). Menyedari hakikat ini, kakitangan ST terus diberikan latihan dan pembangunan yang lebih giat dalam bidang-bidang teknikal dan ekonomi tenaga, termasuk dipinjamkan di agensi tempatan dan antarabangsa bagi memperoleh pengalaman secara praktikal.

Program-program pembangunan dalaman seperti kursus kepimpinan, kursus kemahiran berkomunikasi dan lain-lain bidang kemahiran untuk kakitangan Eksekutif dan kakitangan sokongan juga diteruskan melalui 243 kursus termasuk 57 sesi *Coaching and Mentoring* oleh *Subject Matter Experts*.

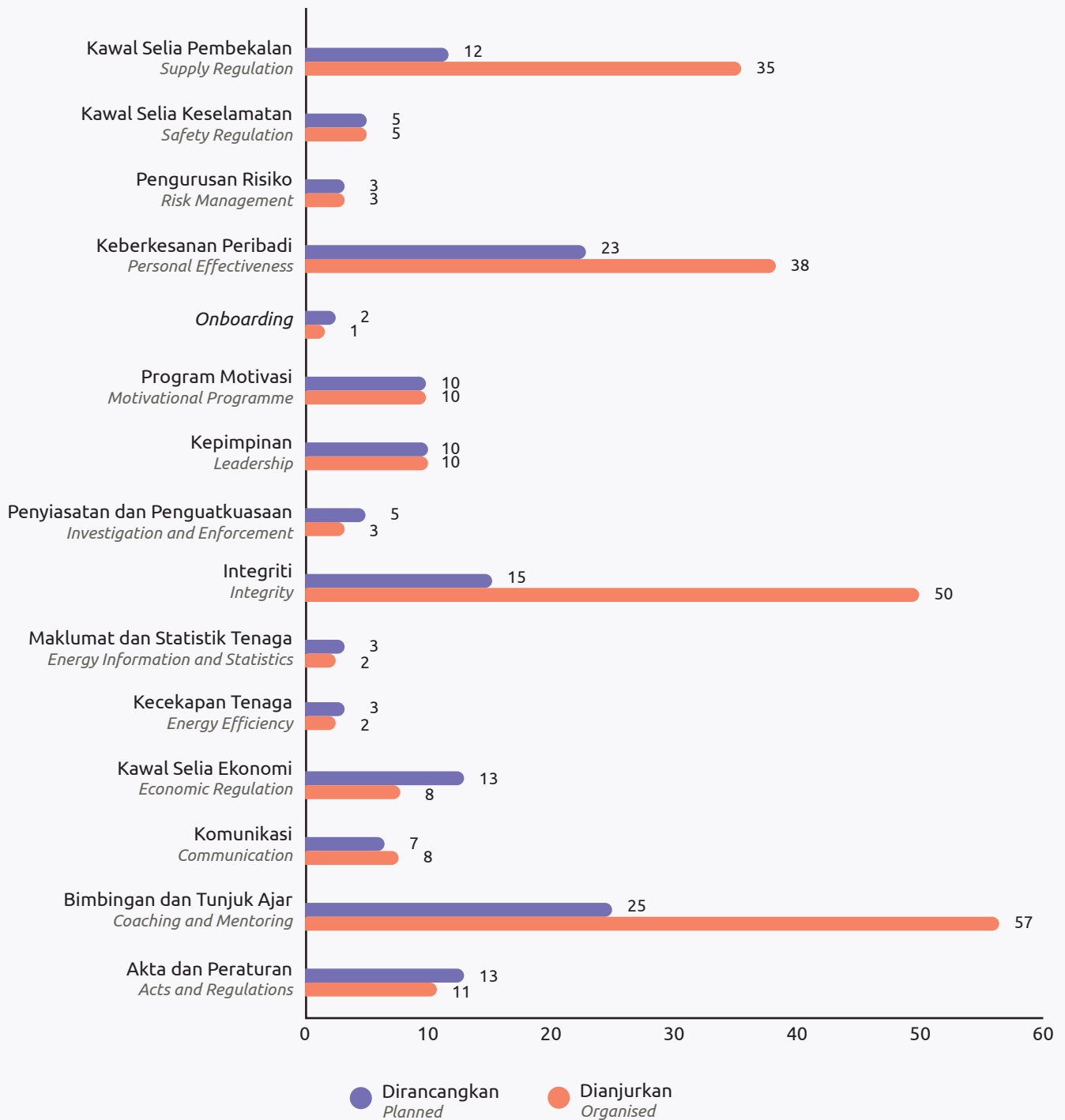
*To ensure that the Commission stays in line with the rapid developments in the energy industry, the Commission's employees were continuously enhanced with up-to-date knowledge and skills in emerging areas such as battery storage, hydrogen, as well as the latest technologies in energy efficiency and renewable energy (RE). Recognising this fact, the Commission's employees are consistently provided with intensive training and development in technical and energy economics fields. This includes opportunities for hands-on experience through secondments to local and international agencies.*

*Internal development programmes such as leadership courses, communication skills courses, and other skill-building programmes for both Executive and support staff were continued through 243 trainings including 57 Coaching and Mentoring sessions conducted by the Subject Matter Experts.*

**Jumlah Kursus Berasaskan Kemahiran, Pengetahuan dan Tingkah Laku, 2022**  
*Total of Training Based on Skill, Knowledge and Attributes, 2022*



**Jenis-jenis Kursus yang Dianjurkan, 2022**  
*Types of Training Organised, 2022*



Selaras dengan Pelan Transformasi Digital yang telah dimulakan oleh ST, program *Data Literate Workforce* telah dimulakan, di mana seramai 10 *Data Champions* telah dipilih sebagai pemangkin kepada usaha memperkasakan kemahiran mengguna dan menyimpan data di ST. Antara latihan-latihan yang diberikan termasuklah *Excel Pivot Table*, *Manipulating Big Data Using Excel Power Query and Power Pivot*, *Fundamental Power BI (Business Intelligence) Desktop* dan *Story Telling with Data*.

Untuk 2022, purata jumlah hari berkursus yang dihadiri oleh kakitangan Eksekutif adalah sebanyak 14 hari berbanding lapan (8) oleh kakitangan Bukan Eksekutif.

*In line with the Digital Transformation Plan initiated by the Commission, the Data Literate Workforce programme has been launched, in which 10 Data Champions have been selected as catalysts to empower data usage and storage skills at the Commission. Among the training provided were Excel Pivot Table, Manipulating Big Data Using Excel Power Query and Power Pivot, Fundamental Power BI (Business Intelligence) Desktop, and Storytelling with Data.*

*For 2022, the average number of training days attended by Executive staff is 14 days compared to eight (8) by Non-Executive staff.*

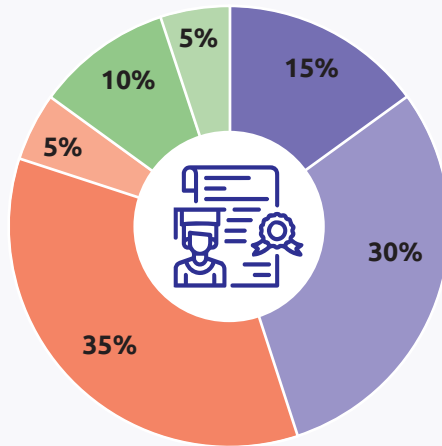


Sehingga 2022, seramai 20 kakitangan telah dianugerahkan biasiswa ST dengan kos sebanyak RM402,601.00. Selain itu, ST juga menyokong usaha kakitangannya untuk mendapatkan Pensijilan Profesional seperti *Professional Engineer (Ir)* dan *Professional Technologist (Ts)* dengan membiayai kos pendaftaran dan fi ujian bagi kelayakan-kelayakan ini. Sehingga kini, seramai 31 kakitangan telah mendapat pensijilan di dalam bidang-bidang profesional ini.

*As of 2022, a total of 20 employees have been awarded scholarships amounting to RM402,601.00 by the Commission. Apart from that, the Commission also supports its employees in obtaining Professional Certifications such as Professional Engineer (Ir) and Professional Technologist (Ts) by covering registration and examination fees for these qualifications. To date, 31 employees have obtained certifications in these professional fields.*



**Pemberian Biasiswa Mengikut Bidang Pengajian**  
*Scholarships Awarded by Field of Study*



-  Sarjana Pentadbiran Perniagaan  
*Master of Business Administration*
-  Sarjana Kejuruteraan Elektrik  
*Master of Electrical Engineering*
-  Sarjana Sains (Pengurusan Tenaga)  
*Master of Science (Energy Management)*
-  Sarjana Komunikasi Massa  
*Master of Mass Communication*
-  Sarjana Sains (Profesional)  
*Master of Science (Professional)*
-  Sarjana (Pengurusan Risiko Keselamatan dan Kesihatan Pekerjaan)  
*Master of Occupational Safety & Health Risk Management*

## Program Kesedaran Undang-undang

### *Legal Awareness Programme*

Bagi meningkatkan kesedaran undang-undang di kalangan warga ST, beberapa program telah diatur melalui dua agenda utama iaitu *ST Lecture Series* dan Sesi Damping Pejabat Kawasan & Klinik Undang-undang. Walaupun terdapat 12 program yang dirancang bagi tahun 2022, ST telah berjaya melaksanakan 16 program sepanjang tahun.

*To enhance legal awareness among the Commission's employees, several programmes have been organised through two main initiatives: the Commission's Lecture Series and the Regional Office Visits & Legal Clinic Sessions. Although there were 12 planned programmes for 2022, the Commission has successfully implemented 16 programmes throughout the year.*

**Objektif Program Kesedaran Undang-undang**  
*Objectives of the Legal Awareness Programme*



**Untuk meningkatkan pemahaman undang-undang pembekalan tenaga di kalangan warga ST.**

*To enhance understanding of energy supply laws among the Commission's employees.*



**Untuk memberikan kesedaran berkenaan risiko-risiko perundangan yang dihadapi dalam menjalankan tugas di ST.**

*To raise awareness about legal risks involved in carrying out duties at the Commission.*



**Untuk memastikan warga ST menjalankan tugas selaras dengan peruntukan undang-undang.**

*To ensure that the Commission's employees perform their duties in compliance with legal provisions.*



**Untuk mendalami isu-isu perundangan yang dihadapi warga ST termasuk di Pejabat-Pejabat Kawasan.**

*To delve into legal issues faced by the Commission's employees, including those at Regional Offices.*

## Program Kesedaran Undang-undang *Legal Awareness Programme*

### *ST Lecture Series* *The Commission's Lecture Series*

- **Kewajipan Pemegang Lesen Untuk Membekalkan Elektrik di Bawah Akta 447**  
*Obligations of the Licensees in Supplying Electricity Under Act 447*
- **Undang-undang Persaingan di Malaysia dan Pemakaiannya dalam Sektor Tenaga**  
*Competition Law in Malaysia and Its Application in the Energy Sector*
- **Anti-Sexual Harassment Bill 2022 – A Brief Overview**
- **Kuasa untuk Mendakwa dan Pengkompunan Kesalahan di Bawah Undang-undang Pembekalan Tenaga**  
*Power to Prosecute and Compounding of Offences under the Energy Supply Laws*
- **ESG - A General Overview and Its Application to the Malaysian Energy Industry**
- **Semakan Kehakiman - Cabaran kepada Kewibawaan ST Sebagai Sebuah Badan Kawal Selia**  
*Judicial Review - Challenges to the Commission's Credibility as a Regulatory Body*
- **Persediaan dalam Kes Sivil Melibatkan ST**  
*Preparation in Civil Cases Involving the Commission*

### *Sesi Damping Pejabat Kawasan dan Klinik Undang-undang* *Regional Office Visits and Legal Clinic Sessions*

- **Semua Pejabat Kawasan ST**  
*All of the Commission's Regional Offices*



# Sorotan Utama

## Main Highlights

### Perkongsian Maklumat Melalui Centralised Information Sharing Channel (CISC)

ST memperkenalkan saluran perkongsian maklumat dalaman #TeamST iaitu Centralised Information Sharing Channel (CISC), agar setiap warga ST sentiasa peka dan maklum akan sebarang informasi dan inisiatif terkini yang dilaksanakan di pelbagai peringkat. CISC yang pertama telah dikeluarkan pada 27 Jun 2022.

Pengisian CISC merangkumi acara, pelancaran, lawatan, seminar, dialog, pameran, bengkel, hari terbuka atau pun mesyuarat yang bukan sulit dan lain-lain. Selain dihebahkan menerusi emel, ia juga dimuat naik ke aplikasi media sosial #TeamST bagi memperluaskan jaringan komunikasi pelbagai medium.

### Sharing Information via the Centralised Information Sharing Channel (CISC)

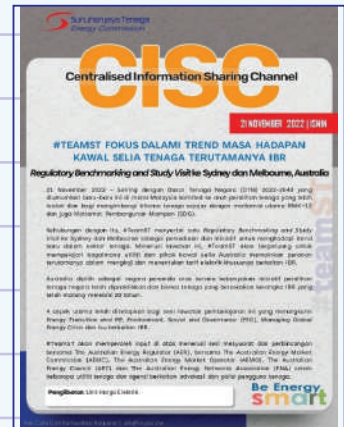
The Commission has introduced the Centralised Information Sharing Channel (CISC) as an internal information-sharing platform for #TeamST to ensure that the Commission's employees are aware and informed about any latest information and initiatives implemented at various levels. The first CISC was issued on 27 June 2022.

CISC content includes events, launches, visits, seminars, dialogues, exhibitions, workshops, open days, non-confidential meetings, and more. In addition to being communicated via email, it is also uploaded to the #TeamST social media application to expand the communication network through various mediums.

2022

89

Artikel CISC telah dihasilkan  
CISC articles have been produced





# INISIATIF *OUTREACH*

## *OUTREACH INITIATIVES*

- 203 **KEMPEN #JADILAH BIJAK TENAGA**  
*#BE ENERGY SMART CAMPAIGN*
- 207 **PROGRAM TOUCHPOINT**  
*TOUCHPOINT PROGRAMME*
- 209 **EE RUN 2022**  
*EE RUN 2022*
- 211 **PENERBITAN INDUSTRI TENAGA**  
*ENERGY INDUSTRY PUBLICATIONS*



## Kempen #Jadilah Bijak Tenaga

### #Be Energy Smart Campaign

Sepanjang 2022, ST berkongsi tips keselamatan elektrik dan penggunaan tenaga secara cekap melalui 380 spot promosi kempen JADILAH BIJAK TENAGA di saluran radio tempatan iaitu BERNAMA Radio, Hitz FM, Melody FM, Raaga FM dan Hot FM. Klip iklan tersebut menyentuh tentang topik-topik berikut:

- Pengecas Telefon Bimbit
- Cekap Tenaga, Kurang Bayar
- Satu Soket, Satu Plug
- Kabel yang Mengikut Standard Keselamatan
- Pemanas Air

Selain itu, buat pertama kalinya, ST turut mengguna pakai medium promosi papan iklan digital berbanding papan iklan statik yang digunakan sebelum ini. Penggunaan papan iklan digital menjadi pilihan kerana ia dapat menyampaikan mesej kempen JADILAH BIJAK TENAGA dalam bentuk video pendek yang lebih menarik.

Papan iklan digital yang terletak di sepanjang Lebuhraya Persekutuan dengan jumlah trafik melebihi 500,000 kenderaan sehari tersebut memaparkan klip video pendek mengenai kepentingan kelengkapan elektrik yang mempunyai label SIRIM-ST dan label cekap tenaga, untuk keselamatan dan penjimatan tenaga.

*Throughout 2022, the Commission shared electrical safety tips and energy-efficient practices through 380 promotional spots of the BE ENERGY SMART campaign on local radio channels, namely BERNAMA Radio, Hitz FM, Melody FM, Raaga FM, and Hot FM. The advertisement clips covered the following topics:*

- *Mobile Phone Charger*
- *Use Energy Efficiently*
- *One Socket, One Plug*
- *Cable that Complies with Safety Standards*
- *Water Heater*

*Furthermore, for the first time, the Commission has also utilised digital billboard advertising medium instead of the static billboards previously used. The use of digital billboards was chosen because it delivers the BE ENERGY SMART campaign message in the form of short videos, which are more engaging.*

*The digital billboards, located along the Federal Highway with a daily traffic volume exceeding 500,000 vehicles, displayed short video clips highlighting the importance of electrical appliances with the SIRIM-ST and energy-efficient labels for safety and energy conservation.*





## Sesi Temu Bual Media

Sepanjang 2022, ST aktif menjalankan sesi temu bual radio dan rancangan TV melalui saluran BERNAMA TV, BERNAMA Radio, Agenda Awani di Astro Awani, Selamat Pagi Malaysia di TV1 dan Pastikan Sahih di RTM. Topik temu bual merangkumi isu tarif elektrik, keselamatan elektrik dan kecekapan tenaga.



**8 Feb** - KPE ST ditemu bual dalam rancangan Agenda Awani mengenai isu tarif elektrik.

*8 Feb - The Commission's CEO was interviewed on the Agenda Awani programme regarding electricity tariff issues.*

## Media Interviews

Throughout 2022, the Commission has actively conducted radio and TV interview sessions through channels such as BERNAMA TV, BERNAMA Radio, Agenda Awani on Astro Awani, Selamat Pagi Malaysia on TV1, and Pastikan Sahih on RTM. The interview topics covered issues related to electricity tariffs, electrical safety and energy efficiency.



**15 Mac** - ST ditemu bual di rancangan Agenda Awani, Astro Awani bersama TNB Fuel bagi membicarakan tentang tarif elektrik.

*15 Mar - The Commission, together with TNB Fuel, were interviewed on the Agenda Awani programme to discuss electricity tariffs.*



**7 Jul** - ST ditemu bual di rancangan The Brief, BERNAMA TV bagi membicarakan tentang isu tarif elektrik.

*7 Jul - The Commission was interviewed on The Brief, a BERNAMA TV programme, to discuss electricity tariff issues.*



**15 Jul** - ST ditemu bual di dalam rancangan Selamat Pagi Malaysia di saluran TV1 mengenai topik Penggunaan Tenaga Secara Cekap yang turut disiarkan secara 'live' di saluran TV1, rtmklik dan di laman Facebook Selamat Pagi Malaysia.

*15 Jul - The Commission was interviewed on Selamat Pagi Malaysia, a TV1 channel programme, regarding the topic Efficient Use of Energy, which was also broadcasted live on TV1, rtmklik, and the Selamat Pagi Malaysia Facebook page.*



**3 Ogos** - Pencerahan berhubung penetapan tarif elektrik diteruskan di BERNAMA Radio.

**3 Aug** - Further enlightenment regarding the electricity tariff determination continued on BERNAMA Radio.



**23 Dis** - ST terus berkongsi maklumat mengenai keselamatan elektrik di musim banjir di dalam temu bual di rancangan Pastikan Sahab, segmen Sudut Pandang yang disiarkan di saluran Berita myFreeview 123, RTM.

**23 Dec** - The Commission continued to share information about electrical safety during the flood season through an interview on the programme Pastikan Sahab, specifically the segment Sudut Pandang, which is broadcasted on myFreeview channel 123, RTM.



**22 Dis** - ST ditemu bual di dalam rancangan Selamat Pagi Malaysia di saluran TV1 mengenai topik keselamatan elektrik di musim banjir.

**22 Dec** - The Commission was interviewed on Selamat Pagi Malaysia, a TV1 channel programme, regarding the topic of electrical safety during the flood season.



**28 Dis** - ST ditemu bual mengenai kepentingan mengutamakan keselamatan elektrik di musim banjir di saluran BERNAMA Radio.

**28 Dec** - The Commission was interviewed about the importance of prioritising electrical safety during the flood season on BERNAMA Radio.

## Artikel Di Media

ST juga telah mengeluarkan artikel melalui BERNAMA di mana artikel-artikel ini turut diguna pakai oleh media-media lain.

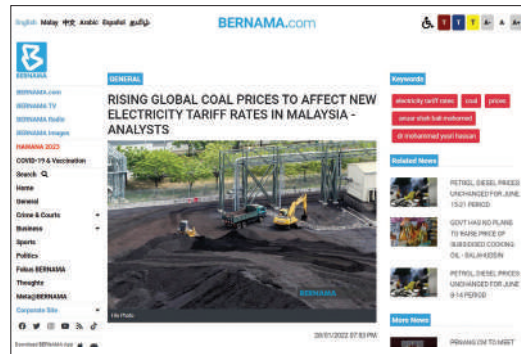
Dalam usaha meningkatkan kefahaman dan kesedaran orang ramai, topik artikel yang dipilih adalah berkenaan tarif elektrik sempena pengumuman tempoh RP3 di bawah mekanisme IBR pada tahun ini.



## Media Articles

The Commission has also released articles through BERNAMA, and these articles have been utilised by other media outlets as well.

In an effort to enhance understanding and raise public awareness, the selected article topics revolve around electricity tariffs in conjunction with the announcement of the RP3 period under the IBR mechanism for this year.

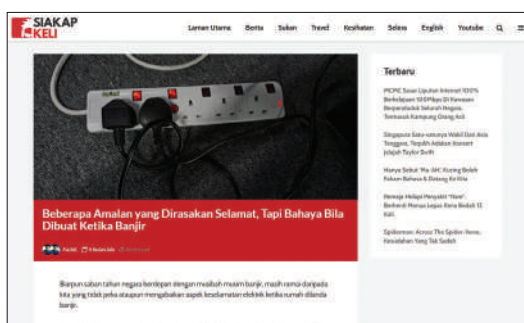
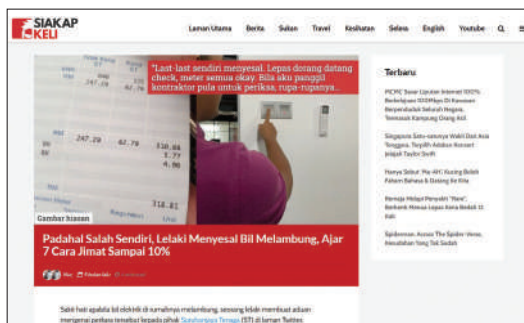


## Media Digital

Bagi memvariasikan lagi kaedah promosi, dan bagi mendekati generasi muda khususnya, ST meneruskan promosi melalui medium media digital. Melalui portal Siakap Keli, ST telah mengeluarkan dua (2) artikel bertajuk “Padahal Salah Sendiri, Lelaki Menyesal Bil Melambung, Ajar 7 Cara Jimat Sampai 10%” yang memfokuskan kepada amalan-amalan kecekapan tenaga, serta “Beberapa Amalan yang Dirasakan Selamat, Tapi Bahaya Bila Dibuat Ketika Banjir” mengenai tips-tips keselamatan elektrik di musim banjir kilat yang melanda negara. Artikel-artikel ini turut disiarkan di laman sosial Facebook dan Instagram, yang telah dikongsi oleh ramai pengguna.

## Digital Media

To diversify promotional methods and to reach out to the younger generation in particular, the Commission continues its promotion through digital media channels. Through the Siakap Keli portal, the Commission has released two articles titled “Padahal Salah Sendiri, Lelaki Menyesal Bil Melambung, Ajar 7 Cara Jimat Sampai 10%” focusing on energy efficiency practices, and “Beberapa Amalan yang Dirasakan Selamat, Tapi Bahaya Bila Dibuat Ketika Banjir” providing tips on electrical safety during sudden floods in the country. These articles have also been shared on social media platforms such as Facebook and Instagram, reaching a wide range of users.





Selain itu, usaha meningkatkan kesedaran orang ramai berkenaan isu-isu industri tenaga dan tips-tips keselamatan dan kecekapan tenaga juga dilakukan melalui media sosial ST sendiri, iaitu di Facebook, Instagram dan Twitter. Langkah ini mendapat sambutan yang baik dari orang ramai di mana hantaran di laman sosial ini menerima jumlah 'Like' dan 'Share' yang tinggi.

Moreover, efforts to raise public awareness about energy industry issues and provide tips on safety and energy efficiency were also conducted through the Commission's social media platforms, namely Facebook, Instagram, and Twitter. This initiative has received a positive response from the public, with posts on these social media platforms receiving high numbers of likes and shares.



## Program Touchpoint

### Touchpoint Programme

Program *Touchpoint* merupakan sebahagian daripada inisiatif Tanggungjawab Sosial Korporat (CSR) ST yang telah mula dijalankan sejak 2014, bertujuan meningkatkan kesedaran orang awam terhadap kepentingan sistem pendawaian elektrik yang selamat, serta penggunaan tenaga elektrik secara bijak dan berhemah.

Aktiviti program melibatkan kerja-kerja pemasangan kotak agihan elektrik baharu, pemasangan Peranti Arus Baki (PAB) yang menepati kehendak Peraturan-peraturan Elektrik 1994, ujian pbumian dan pemutus litar elektrik serta penyusunan litar agihan mengikut kesesuaian dan kapasiti beban. Selain itu, kelengkapan elektrik seperti lampu LED dan kipas juga ditukar kepada yang lebih cekap tenaga.

The *Touchpoint* programme is part of the Commission's Corporate Social Responsibility (CSR) initiative, which has been implemented since 2014. Its aim is to increase public awareness of the importance of safe electrical wiring systems, as well as the efficient and responsible use of electrical energy.

The programme involves activities such as the installation of new electrical distribution boxes, the installation of Residual Current Devices (RCDs) that comply with the requirements of the Electrical Regulations 1994, the testing of grounding and circuit breaker switches, and the arrangement of distribution circuits to ensure suitability and load capacity. In addition, electrical appliances such as LED lights and fans are replaced with more energy-efficient alternatives.

Program ini diharapkan dapat membantu memupuk kesedaran penduduk setempat berkenaan sistem pendawaian elektrik yang mematuhi kehendak Akta Bekalan Elektrik 1990 (Akta 447), agar premis dan kediaman sentiasa berada dalam keadaan selamat.

*This programme is expected to help foster awareness among the local community regarding electrical wiring systems that comply with the requirements of the Electricity Supply Act 1990 (Act 447), ensuring that premises and residences remain in a safe condition.*



**Lokasi dan Aktiviti Program *Touchpoint*, 2022**  
*Touchpoint Programmes Locations and Activities, 2022*

<b>Lokasi</b> <i>Location</i>	<b>Aktiviti</b> <i>Activity</i>
Gelanggang Futsal Felda Bukit Jalor, Negeri Sembilan <i>Felda Bukit Jalor Futsal Arena, Negeri Sembilan</i>	Pembaikan sistem pendawaian <i>Wiring system repair</i>
Rumah orang kurang berkemampuan, Kampung Gumut, Kalumpang, Hulu Selangor, Selangor <i>Underprivileged home, Kampung Gumut, Kalumpang, Hulu Selangor, Selangor</i>	Pembaikan sistem pendawaian dan penggantian kelengkapan rosak <i>Wiring system repair and replacement of faulty equipment</i>
Rumah orang kurang berkemampuan, Kampung Pasir Puteh, Kalumpang, Hulu Selangor, Selangor <i>Underprivileged home, Kampung Pasir Puteh, Kalumpang, Hulu Selangor, Selangor</i>	
Rumah orang kurang berkemampuan, Kampung Gesir Tengah, Kuala Kubu Bharu, Selangor <i>Underprivileged home, Kampung Gesir Tengah, Kuala Kubu Bharu, Selangor</i>	
Rumah orang kurang berkemampuan, Kampung Gesir Ulu, Kuala Kubu Bharu, Selangor <i>Underprivileged home, Kampung Gesir Ulu, Kuala Kubu Bharu, Selangor</i>	
Maahad Tahfiz Al-Quran Al-Iman, Kampung Buloh Poh, Ketereh, Kelantan	
Madrasah Ribat Al-Ahmadiyah, Kampung Tegayong, Melor, Kelantan	
Islamic Outreach Centre Kelantan, Pusat Latihan Dan Dakwah Orang Asli, Kok Lanas, Kelantan	
10 buah rumah penduduk kurang berkemampuan, Pantai Manis, Papar, Sabah <i>10 underprivileged homes, Pantai Manis, Papar, Sabah</i>	
Dewan Perumahan Kuala, Papar, Sabah	
Dewan Serbaguna Kampung Seberang Benoni, Papar, Sabah	



Rumah penduduk kurang berkemampuan, Kampung Kurnia Diraja, Gemas, Negeri Sembilan <i>Underprivileged home, Kampung Kurnia Diraja, Gemas, Negeri Sembilan</i>	Pembaikan atau pemasangan sistem pendawaian baharu serta kelengkapan cekap tenaga, dan pendaftaran dengan utiliti <i>Repair or installation of new wiring systems and energy-efficient appliances, and utility registration</i>
Empat (4) rumah orang kurang berkemampuan, Kampung Selamat, Pinang Tunggal, Kepala Batas, Kedah <i>Four (4) underprivileged homes, Kampung Selamat, Pinang Tunggal, Kepala Batas, Kedah</i>	
Empat (4) rumah orang kurang berkemampuan, Kampung Paya Keladi, Kepala Batas, Kedah <i>Four (4) underprivileged homes, Kampung Paya Keladi, Kepala Batas, Kedah</i>	
Dua (2) rumah orang kurang berkemampuan, Kampung Penaga, Kepala Batas, Kedah <i>Two (2) underprivileged homes, Kampung Penaga, Kepala Batas, Kedah</i>	
Dewan Orang Ramai dan rumah penduduk kurang berkemampuan, Kampung Lahat-Lahat, Tanjung Kapur, Semporna, Sabah <i>Dewan Orang Ramai and underprivileged home, Kampung Lahat-Lahat, Tanjung Kapur, Semporna, Sabah</i>	
Surau Kampung Rancangan Baru, Sungai Gajah Darat, Semporna, Sabah	
Dewan Orang Ramai dan Masjid Kampung Hampalan Laut, Pulau Bum-Bum, Semporna, Sabah	
Surau Al-Mukmin, Kempas, Johor	
Surau Al-Mustaqim, Kempas, Johor	
Balai Raya Taman Seri Bahagia, Kempas, Johor	
Surau Ar-Raudah Kampung Bacang, Tampin, Negeri Sembilan	
Surau An-Nur Felda Jelai 3, Gemas, Negeri Sembilan	
22 rumah asnaf, Guai, Bera, Pahang	
Sekolah Rendah Agama Rakyat Aziziah Kampung Kuala Pari, Ipoh Timur, Perak	
Sekolah Ghazaliatul – Aishah Kampung Kuala Pari Hilir, Ipoh Timur, Perak	
Surau An – Nur Kampung Kuala Pari Hilir, Ipoh Timur, Perak	Pemasangan PAB dan pembaikan sistem pendawaian <i>Installation of RCD and wiring system repair</i>
Surau Kampung Seri Geriang, Mukim Hulu Bernam, Selangor	Penukaran dan penyusunan semula beban di kotak agihan, pemasangan PAB serta pembaikan sistem pendawaian <i>Change and rearranging load in distribution boxes, installation of RCD and wiring system repair</i>

## EE Run 2022

### EE Run 2022

Pada 24 September 2022, ST sekali lagi menganjurkan *Energy Efficiency Run* atau lebih dikenali sebagai *EE Run 2022*. Dengan penyertaan sekitar 1,000 peserta pelbagai usia termasuk kakitangan ST serta ahli keluarga masing-masing, acara ini turut disertai oleh pelari berpengalaman daripada sektor-sektor awam dan swasta, pelajar sekolah menengah serta warga Putrajaya dan persekitarannya.

Setiap peserta yang menamatkan larian masing-masing menerima *finisher medal* dan sijil penyertaan, manakala pemenang tempat pertama hingga ke-10 turut menerima hadiah wang tunai.

*On 24 September 2022, the Commission once again organised the Energy Efficiency Run, also known as EE Run 2022. With the participation of approximately 1,000 participants of various ages, including the Commission's employees and their family members, the event was also attended by experienced runners from both the public and private sectors, high school students, as well as residents of Putrajaya and its surrounding areas.*

*Each participant who completed their run received a finisher medal and a participation certificate, while the first to tenth place winners also received cash prizes.*

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.

Dilancarkan pada 2011, *EE Run* bertujuan mewujudkan kesedaran tentang penggunaan tenaga secara cekap di samping menggalakkan gaya hidup sihat. Kali terakhir *EE Run* diadakan adalah pada 2019, dengan penyertaan sekitar 1,400 peserta. Acara yang sepatutnya diadakan dua tahun sekali ini tidak dapat dianjurkan pada 2021 kerana kekangan pandemik COVID-19.

*Apart from running, there were exhibitions, games and quizzes about energy efficiency to entertain visitors while providing exposure to efficient and safe energy usage.*

*Launched in 2011, the EE Run aims to create awareness about energy efficiency and promote a healthy lifestyle. The last EE Run was held in 2019, with around 1,400 participants. The biennially event could not be held in 2021 due to the constraints posed by the COVID-19 pandemic.*





# Penerbitan Industri Tenaga

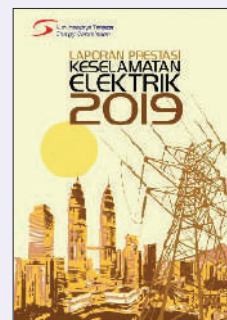
## Energy Industry Publications

Maklumat berkaitan sektor tenaga turut disalurkan melalui pelbagai penerbitan merangkumi laporan pencapaian dan pelan pembangunan di ST, termasuklah maklumat landskap industri tenaga negara, serantau dan juga global.

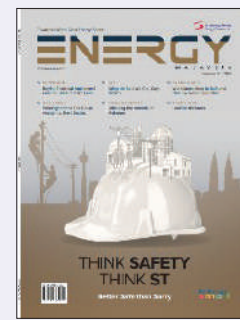
Information related to the energy sector was also channelled through various publications, including the Commission's achievement reports and development plans. It also encompasses information regarding the national, regional and global energy industry landscape.



**Laporan Tahunan 2021 dan Laporan Kumpulan Wang Industri Elektrik 2021**  
*Annual Report 2021 and Electricity Industry Fund (KWIE) Report 2021*



**Maklumat dan Statistik Sektor Tenaga**  
*Energy Sector Information and Statistics*



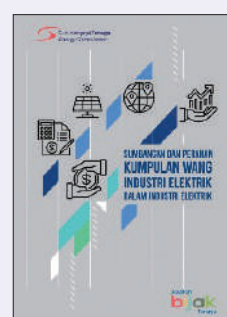
**Majalah Energy Malaysia**  
*Energy Malaysia Magazine*



**Rujukan Dalaman**  
*Internal Reference*



**Garis Panduan Industri Elektrik dan Gas Berpaip**  
*Electricity and Piped Gas Industry Guidelines*



**Rujukan Pengguna**  
*Consumer Reference*



**Rujukan Pengguna**  
*Consumer Reference*

# LAPORAN PENCAPAIAN PETUNJUK PRESTASI UTAMA (KPI) 2022

*KEY PERFORMANCE  
INDICATOR (KPI)  
ACHIEVEMENT REPORT  
FOR 2022*





# Laporan Pencapaian Petunjuk Prestasi Utama (KPI) 2022

## Key Performance Indicator (KPI) Achievement Report For 2022

Bagi meningkatkan lagi keberkesanan ST sebagai badan kawal selia, satu set Petunjuk Prestasi Utama (KPI) Korporat telah diguna pakai pada 2022.

To further enhance the effectiveness of the Commission as a regulatory body, a set of Corporate Key Performance Indicators (KPIs) was implemented in 2022.

Secara keseluruhan, pencapaian purata bagi semua KPI 2022 ST berada pada tahap 95%, walaupun terdapat cabaran dalam melaksanakan inisiatif-inisiatif yang telah disasarkan.

Overall, the average achievement for all of the Commission's KPIs in 2022 was 95%, despite facing challenges in implementing the targeted initiatives.



### PENCAPAIAN PETUNJUK PRESTASI UTAMA (KPI) 2022



#### Objektif Strategik 1 | Strategic Objective 1

#### Keselamatan dan Penguatkuasaan Safety and Enforcement

- Sehingga 2022, jumlah perakuan kekompetenan elektrik yang dikeluarkan adalah sebanyak 157,340 perakuan, manakala untuk pemegang perakuan kekompetenan gas adalah sebanyak 1,208 orang.  
As of 2022, the total number of electrical competency certifications issued was 157,340, while the total number of gas competency certification holders was 1,208.



### Objektif Strategik 2 | Strategic Objective 2

## Keberterusan Bekalan Tenaga

### Energy Security

- Jumlah margin rizab adalah sebanyak 40% untuk kapasiti terpasang di Semenanjung dan 23% untuk kapasiti boleh harap di Sabah.  
*The total reserve margin for installed capacity in the Peninsula is 40%, and 23% for dependable capacity in Sabah.*
- Penyaluran tenaga elektrik melalui *Power Integration Project* antara Lao PDR-Thailand-Malaysia-Singapore (LTMS) berjaya dimulakan pada Jun.  
*The electricity transmission through the Power Integration Project between Lao PDR-Thailand-Malaysia-Singapore (LTMS) was successfully initiated in June.*



### Objektif Strategik 3 | Strategic Objective 3

## Daya Harap Pembekalan Tenaga dan Kualiti Perkhidmatan Industri

### Reliability of Energy Supply and Service Quality of the Industry

- Catatan SAIDI elektrik di Semenanjung adalah sebanyak 45.06 minit/pelanggan/tahun dan Sabah 286.22 minit/pelanggan/tahun.  
*SAIDI electricity records in the Peninsula and Sabah were at 45.06 minutes/customer/year, and 286.22 minutes/customer/year, respectively.*
- Catatan SAIDI sistem bekalan gas berpaip untuk sektor bukan tenaga di Semenanjung adalah sebanyak 0 minit/pelanggan/tahun.  
*SAIDI piped gas supply system for the non-energy sector in the Peninsula was at 0 minutes/customer/year.*
- Tiada gangguan bekalan elektrik berskala besar berlaku.  
*No major power supply disruptions occurred.*



### Objektif Strategik 4 | Strategic Objective 4

## Kecekapan Ekonomi dan Kemampuan

### Economic Efficiency and Affordability

- Penetapan kadar purata tarif asas elektrik di Semenanjung berdasarkan parameter utama mengikut amalan-amalan terbaik untuk IBR TNB RP3 (2022-2024).  
*The setting of the average electricity base tariff rates in Peninsula is based on key parameters following best practices for TNB's IBR RP3 (2022-2024).*
- Pelarasan tarif elektrik dan gas asli di bawah mekanisme ICPT yang mencerminkan harga sebenar kos bahan api di pasaran.  
*Adjustments of electricity and natural gas tariffs under the ICPT mechanism that reflects the actual market fuel costs.*
- Kuota Program *Green Electricity Tariff* sebanyak 4,000 GWj dipenuhi pada April.  
*The 4,000 GWh quota for the Green Electricity Tariff programme was fulfilled in April.*



### Objektif Strategik 5 | Strategic Objective 5

## Kemampanan Tenaga

### Energy Sustainability

- Penjimatan tenaga elektrik tahunan sehingga 2022 di bawah NEEAP adalah sebanyak 8,281 GWj.  
*The annual electricity savings until 2022 under the NEEAP amounted to 8,281 GWh.*
- Pencapaian penjimatan tenaga sebanyak 110.7 GWj di bawah program SAVE 3.0.  
*Energy savings achievement of 110.7 GWh under the SAVE 3.0 programme.*
- Penganjuran EE Challenge 2022 dilaksanakan dengan penerimaan sebanyak 3,189 penyertaan untuk semua kategori yang dipertandingkan.  
*The organisation of the EE Challenge 2022 with a total of 3,189 participants across all contested categories.*



### Objektif Strategik 6 | Strategic Objective 6

## Kualiti Kawal Selia dan Penyampaian Perkhidmatan

### Regulatory Quality and Service Delivery

- Peratus tahap kepuasan pelanggan melalui Kajian Kepuasan Pelanggan (CSI) ST adalah sebanyak 91.2%.  
*The percentage of customer satisfaction through the Commission's Customer Satisfaction Index (CSI) stood at 91.2%.*
- Penerimaan Pensijilan bagi Audit Pemantauan Kedua ISO 9001:2015 dari *Lloyds Register Quality Assurance* (LRQA).  
*Receive the Certificate for Second Surveillance Audit ISO 9001:2015 from Lloyds Register Quality Assurance (LRQA).*
- Pelaksanaan kajian Business Process Reengineering di bawah projek Transformasi Digital ST untuk meningkatkan keberkesanan penyampaian perkhidmatan ST secara dalam talian.  
*Implementation of the Business Process Reengineering study under the Commission's Digital Transformation Project to increase the effectiveness of the Commission's service delivery online.*



### Objektif Strategik 7 | Strategic Objective 7

## Pembangunan Kapasiti dan Keupayaan

### Capacity and Capability Development

- Program Pembangunan Kepimpinan diperluaskan dan sebanyak 243 sesi latihan dilaksanakan.  
*The Leadership Development Programme was expanded, and a total of 243 training sessions were conducted.*
- 11 *Subject Matter Expert* (SME) dalaman telah dikenal pasti bagi tujuan bimbingan dan tunjuk ajar (*mentoring and coaching*).  
*11 internal Subject Matter Experts (SMEs) have been identified for the purpose of mentoring and coaching.*

# **PENYATA KEWANGAN**

*FINANCIAL STATEMENTS*







**SIJIL KETUA AUDIT NEGARA  
MENGENAI PENYATA KEWANGAN  
SURUHANJAYA TENAGA  
BAGI TAHUN BERAKHIR 31 DISEMBER 2022**

**Sijil Mengenai Pengauditan Penyata Kewangan**

**Pendapat**

Saya telah memberikan kuasa kepada firma audit swasta di bawah Subseksyen 7 (3) Akta Audit 1957 [*Akta 62*] untuk mengaudit Penyata Kewangan Suruhanjaya Tenaga. Penyata kewangan tersebut merangkumi Penyata Kedudukan Kewangan pada 31 Disember 2022 Suruhanjaya Tenaga dan Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih/Ekuiti, Penyata Aliran Tunai serta Penyata Prestasi Bajet bagi tahun berakhir pada tarikh tersebut dan nota kepada penyata kewangan termasuklah ringkasan polisi perakaunan yang signifikan seperti yang dinyatakan pada muka surat 1 hingga 35.

Pada pendapat saya, penyata kewangan ini memberikan gambaran yang benar dan saksama mengenai kedudukan kewangan Suruhanjaya Tenaga pada 31 Disember 2022 dan prestasi kewangan serta aliran tunai bagi tahun berakhir pada tarikh tersebut selaras dengan Piawaian Perakaunan Sektor Awam Malaysia (MPSAS) dan keperluan Akta Suruhanjaya Tenaga 2001 [*Akta 610*] serta Akta Suruhanjaya Tenaga (Pindaan) 2010 [*Akta A1371*].

**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, 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 Terhadap Penyata Kewangan**

Anggota Suruhanjaya bertanggungjawab terhadap penyediaan Penyata Kewangan Suruhanjaya Tenaga yang memberi gambaran benar dan saksama selaras dengan Piawaian Perakaunan Sektor Awam Malaysia (MPSAS) dan keperluan Akta Suruhanjaya Tenaga 2001 [Akta 610] serta Akta Suruhanjaya Tenaga (Pindaan) 2010 [Akta A1371]. Anggota Suruhanjaya 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 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;
- d. membuat kesimpulan terhadap kesesuaian penggunaan asas perakaunan untuk usaha berterusan oleh Anggota Suruhanjaya 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. Bagaimanapun, peristiwa atau keadaan pada masa hadapan berkemungkinan menyebabkan Suruhanjaya Tenaga tidak lagi berupaya meneruskan operasi secara usaha berterusan; dan
- e. menilai persembahan secara keseluruhan, struktur dan kandungan Penyata Kewangan Suruhanjaya Tenaga, termasuk pendedahannya, dan sama ada penyata kewangan tersebut telah melaporkan asas-asas urus niaga dan peristiwa-peristiwa yang memberikan gambaran saksama.

Anggota Suruhanjaya telah dimaklumkan, antaranya mengenai skop dan tempoh pengauditan yang dirancang serta penemuan audit yang signifikan termasuk kelemahan kawalan dalaman yang dikenal pasti semasa pengauditan.

## Hal-hal Lain

Sijil ini dibuat untuk Anggota Suruhanjaya, Suruhanjaya Tenaga berdasarkan keperluan Akta Suruhanjaya Tenaga 2001 [Akta 610] serta Akta Suruhanjaya Tenaga (Pindaan) 2010 [Akta A1371] dan bukan untuk tujuan lain. Saya tidak bertanggungjawab terhadap pihak lain bagi kandungan sijil ini.



**(FARIZAH BINTI BERAM)**  
b.p. KETUA AUDIT NEGARA  
MALAYSIA

PUTRAJAYA  
16 JUN 2023





## **PENYATA PENERUSI DAN SEORANG ANGGOTA SURUHANJAYA TENAGA**

Kami Mohammed Rashdan bin Mohd Yusof dan Datuk Darryl Goon Siew Chye yang merupakan Pengerusi dan salah seorang Anggota Suruhanjaya Tenaga dengan ini menyatakan bahawa, pada pendapat Anggota, Penyata Kewangan yang mengandungi Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih/Ekuiti, Penyata Aliran Tunai dan Penyata Prestasi Bajet Suruhanjaya Tenaga 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 2022 dan hasil kendaliannya serta perubahan kedudukan kewangannya bagi tahun berakhir pada tarikh tersebut.

Bagi pihak Anggota,

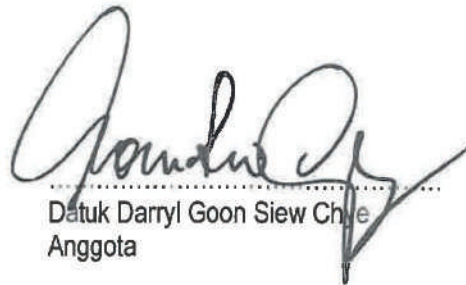


Mohammed Rashdan bin Mohd Yusof  
Pengerusi

Tarikh: **16 JUN 2023**

Tempat: Suruhanjaya Tenaga  
Presint 2, Putrajaya

Bagi pihak Anggota,



Datuk Darryl Goon Siew Chye  
Anggota

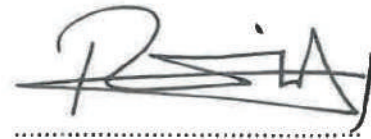
Tarikh: **16 JUN 2023**

Tempat: Suruhanjaya Tenaga  
Presint 2, Putrajaya

**PENGAKUAN OLEH PEGAWAI UTAMA YANG BERTANGGUNGJAWAB  
KE ATAS PENGURUSAN KEWANGAN  
SURUHANJAYA TENAGA**

Saya, Dato' Ir. Ts. Abdul Razib bin Dawood, pegawai utama yang bertanggungjawab ke atas pengurusan kewangan dan rekod-rekod perakaunan Suruhanjaya Tenaga, dengan ikhlasnya mengakui bahawa Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih/Ekuiti, Penyata Aliran Tunai dan Penyata Prestasi Bajet Suruhanjaya Tenaga dalam kedudukan kewangan yang berikut ini berserta dengan 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 **KUALA LUMPUR** )  
pada **16 JUN 2023** )



Di hadapan saya,



No. 59, Jalan Telawi  
Bangsar  
59100 Kuala Lumpur

**SURUHANJAYA TENAGA**Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)**PENYATA KEDUDUKAN KEWANGAN  
Pada 31 Disember 2022**

	Nota	2022 RM	2021 RM
<b>ASET</b>			
<b><u>Aset Semasa</u></b>			
Tunai dan Kesetaraan Tunai	4	151,991,166	123,159,269
Pelaburan Jangka Pendek		413,378,762	407,321,072
Pelbagai Akaun Belum Terima, Deposit dan Pendahuluan	5	670,009	669,336
Pendapatan Faedah Belum Terima	6	3,428,328	2,255,183
Cukai Terdahulu	7	1,692,162	1,234,293
Jumlah Aset Semasa		571,160,427	534,639,153
<b><u>Aset Bukan Semasa</u></b>			
Hartanah, Kelengkapan dan Peralatan	8	75,377,978	76,659,616
<b>Jumlah Aset</b>		<b>646,538,405</b>	<b>611,298,769</b>
<b>LIABILITI</b>			
<b><u>Liabiliti Semasa</u></b>			
Pelbagai Akaun Belum Bayar dan Perbelanjaan Terakru	9	15,357,509	14,939,204
Peruntukan Manfaat Pekerja Jangka Pendek	10	3,282,678	4,024,349
Kumpulan Wang Khas	11	2,326,682	5,706,219
Jumlah Liabiliti Semasa		20,966,869	24,669,772
<b><u>Liabiliti Bukan Semasa</u></b>			
Peruntukan Manfaat Pekerja Jangka Panjang	10	20,127,476	16,126,723
<b>Jumlah Liabiliti</b>		<b>41,094,345</b>	<b>40,796,495</b>
<b>Aset Bersih</b>		<b>605,444,060</b>	<b>570,502,274</b>
<b><u>ASET BERSIH/EKUITI</u></b>			
<b>Dana Terkumpul</b>		<b>605,444,060</b>	<b>570,502,274</b>

Nota-nota yang disertakan dari muka surat 6 hingga 35 adalah sebahagian daripada Penyata Kewangan ini.

## SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

### PENYATA PRESTASI KEWANGAN Bagi Tahun Berakhir 31 Disember 2022

	Nota	2022 RM	2021 RM
<b>PENDAPATAN</b>			
<b>Hasil Daripada Urus Niaga Bukan Pertukaran</b>			
Yuran dan Caj	12	131,352,893	112,745,167
<b>Hasil Daripada Urus Niaga Pertukaran</b>			
Faedah		12,415,997	10,616,965
Lain-lain Pendapatan		131,879	40,395
<b>JUMLAH PENDAPATAN</b>		<b>143,900,769</b>	<b>123,402,527</b>
<b>PERBELANJAAN</b>			
Gaji, Elaun dan Manfaat Pekerja	13	70,149,182	63,412,490
Perjalanan dan Sara Hidup		2,850,449	455,733
Perhubungan dan Utiliti		2,505,445	2,426,535
Sewaan		2,847,937	2,698,690
Hospitaliti		420,576	233,121
Bekalan Pejabat		1,039,796	947,733
Penyenggaraan	14	7,171,112	6,110,333
Perkhidmatan Ikhhtisas	15	9,625,543	10,431,437
Susut Nilai Hartanah, Kelengkapan dan Peralatan		2,761,679	2,924,624
Perbelanjaan Lain	16	5,939,588	831,714
<b>JUMLAH PERBELANJAAN</b>		<b>(105,311,307)</b>	<b>(90,472,410)</b>
Lebihan Sebelum cukai		38,589,462	32,930,117
Cukai	17	(3,647,676)	(3,107,083)
Lebihan Bersih Semasa		<b>34,941,786</b>	<b>29,823,034</b>

Nota-nota yang disertakan dari muka surat 6 hingga 35 adalah sebahagian daripada Penyata Kewangan ini.



## SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

### PENYATA PERUBAHAN ASET BERSIH/EKUITI Bagi Tahun Berakhir 31 Disember 2022

	<b>Jumlah RM</b>
<b>2021</b>	
Baki pada 1 Januari	540,679,240
Lebihan bagi tahun	29,823,034
Baki pada 31 Disember	<u>570,502,274</u>
<b>2022</b>	
Baki pada 1 Januari	570,502,274
Lebihan bagi tahun	34,941,786
Baki pada 31 Disember	<u>605,444,060</u>

Nota-nota yang disertakan dari muka surat 6 hingga 35 adalah sebahagian daripada Penyata Kewangan ini.

## SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

### PENYATA ALIRAN TUNAI Bagi Tahun Berakhir 31 Disember 2022

	Nota	2022 RM	2021 RM
<b>ALIRAN TUNAI DARIPADA AKTIVITI OPERASI</b>			
Lebihan Pendapatan Sebelum Cukai		38,589,462	32,930,117
<b>Pelarasan Untuk Perkara Yang Tidak Melibatkan Tunai:</b>			
Pendapatan Faedah Diterima		(12,415,997)	(10,616,965)
Susut Nilai Hartanah, Kelengkapan dan Peralatan	8	2,761,679	2,924,624
Pelupusan Hartanah, Kelengkapan dan Peralatan	8	4	10
Peruntukan Manfaat Pekerja	10	7,421,440	3,811,684
Keuntungan Operasi Sebelum Perubahan Modal Kerja		36,356,588	29,049,470
Perubahan Dalam Modal Kerja dan Kumpulan Wang Khas: (Peningkatan) di dalam Pelbagai Akaun Belum Terima dan Faedah Belum Terima		(1,173,818)	(104,487)
Peningkatan di dalam Pelbagai Akaun Belum Bayar dan Tanggung Terakru		418,305	1,577,036
Pemberian Kerajaan/Agensi	11	153,000	-
Faedah Kumpulan Wang Khas	11	53,339	57,400
Perbelanjaan Kumpulan Wang Khas	11	(3,585,876)	(98,660)
<b>Tunai Dijana Daripada Aktiviti Operasi</b>		<b>32,221,538</b>	<b>30,480,759</b>
Bayaran Cukai	7	(4,105,545)	(8,446,921)
Bayaran Manfaat Pekerja	10	(4,162,358)	(2,887,807)
<b>Aliran Tunai Bersih Dijana Daripada Aktiviti Operasi</b>		<b>23,953,635</b>	<b>19,146,031</b>
<b>ALIRAN TUNAI DARIPADA AKTIVITI PELABURAN</b>			
Pelaburan Jangka Pendek		(6,057,690)	(9,092,440)
Pembelian Hartanah, Kelengkapan dan Peralatan	8	(1,480,045)	(748,616)
Pendapatan Faedah Diterima		12,415,997	10,616,965
<b>Aliran Tunai Bersih Daripada Aktiviti Pelaburan</b>		<b>4,878,262</b>	<b>775,909</b>
Peningkatan Bersih Dalam Tunai Kesetaraan Tunai		28,831,897	19,921,940
<b>Tunai dan Kesetaraan Tunai Pada Awai Tahun</b>		<b>123,159,269</b>	<b>103,237,329</b>
<b>Tunai dan Kesetaraan Tunai Pada Akhir Tahun</b>	4	<b>151,991,166</b>	<b>123,159,269</b>

Nota-nota yang disertakan dari muka surat 6 hingga 35 adalah sebahagian daripada Penyata Kewangan ini.

**SURUHANJAYA TENAGA**Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)**PENYATA PRESTASI BAJET  
Bagi Tahun Berakhir 31 Disember 2022**

Sebenar 2021	Perihal	Sebenar 2022	Bajet Akhir 2022	Bajet Asal 2022	Perbezaan Bajet Akhir dengan Sebenar
RM		RM	RM	RM	RM
	<b><u>HASIL</u></b>				
112,745,167	Hasil Operasi	131,352,893	117,191,852	117,191,852	14,161,041
10,657,360	Pendapatan Faedah, Keuntungan Hibah dan Lain-lain Pendapatan	12,547,876	9,524,000	9,524,000	3,023,876
<b>123,402,527</b>	<b>Jumlah Hasil</b>	<b>143,900,769</b>	<b>126,715,852</b>	<b>126,715,852</b>	<b>17,184,917</b>
	<b><u>PERBELANJAAN</u></b>				
63,412,490	Emolumen	70,092,812	71,928,000	71,928,000	1,835,188
455,733	Perjalanan dan Sara Hidup	2,850,449	2,850,449	2,745,000	-
2,426,535	Perhubungan dan Utiliti	2,505,445	3,150,000	3,150,000	644,555
2,698,690	Sewaan	2,847,937	3,530,000	3,530,000	682,063
233,121	Hospitaliti	420,576	420,576	260,000	-
654,046	Bekalan Pejabat	729,275	1,843,200	1,840,000	1,113,925
4,933,816	Penyenggaraan	5,151,426	8,185,263	8,300,000	3,033,837
8,655,488	Perkhidmatan Ikhlas	10,298,167	20,828,512	20,983,000	10,530,345
831,714	Perbelanjaan Lain	5,919,608	12,085,000	6,835,000	6,165,392
211,017	Aset	906,639	1,950,000	1,950,000	1,043,361
<b>84,512,650</b>	<b>Jumlah Perbelanjaan</b>	<b>101,722,334</b>	<b>126,771,000</b>	<b>121,521,000</b>	<b>25,048,666</b>
<b>38,889,877</b>	<b>Lebihan/(Kurangan)</b>	<b>42,178,435</b>	<b>(55,148)</b>	<b>5,194,852</b>	<b>(7,863,749)</b>

Nota-nota yang disertakan dari muka surat 6 hingga 35 adalah sebahagian daripada Penyata Kewangan ini.

# SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

## 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 penjaan tenaga termasuk mengawal selia setiap individu yang berlesen bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371).

Penyata Kewangan ini telah diluluskan dan diperakukan oleh Suruhanjaya Tenaga untuk ditandatangani pada 16 Jun 2023.

### 2. Asas Penyediaan Penyata Kewangan

Pelaporan penyata kewangan Suruhanjaya Tenaga telah disediakan pada asas akruan mengikut Piawaian Perakaunan Sektor Awam Malaysia (MPSAS). Penyata kewangan ST disediakan berasaskan konvensyen kos sejarah dan amalan perakaunan yang diterima umum di Malaysia. MPSAS 33 membenarkan pengguna kali pertama untuk mengiktiraf dan mengukur Aset dan Liabiliti tertentu dalam tempoh satu (1) hingga tiga (3) tahun.

Suruhanjaya Tenaga menggunakan piawaian MPSAS bermula pada 1 Januari 2020 dengan tarikh peralihan pada 1 Januari 2019 seperti berikut:

MPSAS 1: Pembentangan Penyata Kewangan

MPSAS 2: Penyata Aliran Tunai

MPSAS 3: Dasar Perakaunan, Perubahan dalam Anggaran Perakaunan dan Kesilapan

MPSAS 4: Kesan Perubahan Kadar Pertukaran Asing

MPSAS 9: Hasil daripada Urus Niaga Pertukaran

MPSAS 14: Peristiwa Selepas Tarikh Pelaporan

MPSAS 17: Hartanah, Loji dan Peralatan

MPSAS 19: Peruntukan, Liabiliti Luar Jangka dan Aset Luar Jangka

MPSAS 20: Pendedahan Pihak Berkaitan

MPSAS 21: Penjejasan Nilai Aset Tidak Menjana Tunai

MPSAS 22: Pendedahan kepada Maklumat Kewangan



# SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
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## Nota-nota kepada Penyata Kewangan...sambungan

### 2. Asas Penyediaan Penyata Kewangan...sambungan

MPSAS 23: Hasil daripada Urus Niaga Bukan Pertukaran (Cukai dan Pindahan)

MPSAS 24: Pembentangan Maklumat Bajet dalam Penyata Kewangan

MPSAS 25: Manfaat Pekerja

MPSAS 26: Penjejasan Nilai Aset Menjana Tunai

MPSAS 28: Instrumen Kewangan - Persembahan

MPSAS 29: Instrumen Kewangan - Pengukuran dan Pengiktirafan

MPSAS 30: Instrumen Kewangan - Pendedahan

MPSAS 33: Pemakaian Kali Pertama MPSAS Berasaskan Akruan

Penyediaan Penyata Kewangan 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

#### (I). Hartanah, Kelengkapan dan Peralatan

Hartanah, Kelengkapan dan Peralatan dinyatakan pada kos ditolak susut nilai terkumpul dan rosot nilai, jika ada.

Susut nilai bagi hartanah, kelengkapan dan peralatan dikira berdasarkan kaedah asas garis lurus ke atas anggaran jangka masa guna aset berkenaan.

Kadar tahunan susut nilai 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.

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IV). Hartanah, Kelengkapan dan Peralatan...sambungan

Nilai sisa, jangka hayat dan kaedah susut nilai dikaji semula pada setiap akhir tahun kewangan bagi memastikan amaunnya, kaedah dan tahun susut nilai adalah selaras dengan anggaran sebelumnya serta corak penggunaan manfaat ekonomi hartanah dan peralatan tersebut.

##### (V). Aset Kewangan

Aset kewangan diiktiraf dalam Penyata Kedudukan Kewangan apabila Suruhanjaya menjadi pihak kepada peruntukan kontrak instrumen.

Pada pengiktirafan awal, Aset Kewangan adalah diukur pada nilai saksama, termasuk kos urus niaga untuk Aset Kewangan yang tidak diukur pada nilai saksama menerusi lebihan atau kurangan, yang terlibat secara langsung di dalam menerbit Aset Kewangan.

Selepas pengiktirafan awal, Aset Kewangan akan dikelaskan kepada salah satu daripada empat kategori Aset Kewangan iaitu Aset Kewangan diukur pada nilai saksama melalui lebihan atau kurangan, pinjaman dan belum terima, pelaburan dipegang hingga matang dan Aset Kewangan sedia untuk dijual.

Pembelian atau penjualan Aset Kewangan yang memerlukan penyerahan aset dalam tempoh masa yang ditetapkan oleh peraturan atau konvensyen di dalam pasaran akan diiktiraf pada tarikh urus niaga itu dibuat, iaitu tarikh di mana Suruhanjaya membuat komitmen untuk membeli atau menjual aset tersebut.

Pihak Suruhanjaya mempunyai Kategori Aset Kewangan seperti berikut:

##### (a). Pinjaman dan Belum Terima

Pinjaman dan Belum Terima adalah Aset Kewangan bukan derivatif dengan bayaran tetap atau pembayaran yang tidak tersiar harga di dalam pasaran aktif. Selepas pengiktirafan awal, Aset Kewangan tersebut kemudiannya diukur pada nilai kos dilunaskan dengan menggunakan kaedah faedah efektif dan ditolak rosot nilai. Kos dilunaskan dikira dengan mengambil kira apa-apa diskaun atau premium atas pembelian aset tersebut serta

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (II). Aset Kewangan...sambungan

###### (a). Pinjaman dan Belum Terima...sambungan

yuran atau kos yang merupakan sebahagian daripada kadar faedah efektif. Kerugian yang timbul daripada kemerosotan nilai diiktiraf dalam lebihan atau kurangan. Pinjaman dan Belum Terima diklasifikasikan sebagai aset semasa kecuali Pinjaman dan Belum Terima di mana tarikh matang adalah melebihi 12 bulan selepas tarikh laporan yang diklasifikasikan sebagai Aset Bukan Semasa.

###### (b). Aset Kewangan Pada Nilai Saksama Melalui Lebihan atau Kurangan

Bagi mana-mana derivatif terbenam yang tidak boleh dinilai dengan yakin secara berasingan sama ada pada tarikh pengambilalihan atau pada tarikh akhir tempoh laporan yang berikutnya, keseluruhan instrumen tersebut ditetapkan pada Nilai Saksama Melalui Lebihan atau Kurangan.

Walau bagaimanapun, jika keseluruhan instrumen tidak boleh dinilai dengan yakin, instrumen tersebut dinyatakan pada nilai kos selepas ditolak rosot nilai.

###### (c). Pelaburan Dipegang Hingga Matang

Aset Kewangan bukan derivatif dengan tempoh matang pembayaran tetap atau boleh ditentukan dan tetap diklasifikasikan sebagai dipegang untuk matang apabila Suruhanjaya mempunyai niat positif dan keupayaan untuk memegang sehingga matang. Selepas pengukuran awal, pelaburan dipegang hingga matang diukur pada kos yang dilunaskan menggunakan kaedah faedah berkesan dan ditolak rosot nilai. Kos pelunasan dikira dengan mengambil kira apa-apa diskaun atau premium atas pengambilalihan dan yuran atau kos yang merupakan sebahagian daripada kadar faedah efektif. Kerugian yang timbul daripada kemerosotan nilai diiktiraf dalam Penyata Prestasi Kewangan.

Suruhanjaya akan menyahiktiraf Aset Kewangan atau, jika berkenaan, sebahagian daripada Aset Kewangan atau sebahagian daripada sekumpulan Aset Kewangan apabila:

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (II). Aset Kewangan...sambungan

(c). Pelaburan Dipegang Hingga Matang...sambungan

(iv). Hak untuk menerima aliran tunai daripada aset telah luput atau dikecualikan;

(v). Suruhanjaya telah memindahkan haknya untuk menerima aliran tunai daripada aset atau telah menerima obligasi untuk membayar aliran tunai yang diterima secara penuh tanpa kelewatan material kepada pihak ketiga; dan sama ada: (i) Suruhanjaya telah memindahkan sebahagian besar risiko dan ganjaran aset; atau (ii) Suruhanjaya tidak memindahkan atau mengekalkan sebahagian besar risiko dan ganjaran aset, tetapi telah memindahkan kawalan aset tersebut.

Sebarang perbezaan di antara nilai dibawa aset kewangan yang dinyahiktiraf dan pertimbangan diterima adalah diiktiraf di dalam Penyata Prestasi Kewangan dalam tempoh penyahiktirafan.

(d). Aset Kewangan Sedia Dijual

Aset Kewangan Sedia Dijual adalah Aset Kewangan yang ditetapkan sebagai sedia untuk dijual atau tidak diklasifikasikan dalam mana-mana kategori Aset Kewangan lain. Selepas pengiktirafan asal, Aset Kewangan sedia dijual dinyatakan pada nilai saksama. Keuntungan atau kerugian daripada perubahan nilai saksama Aset Kewangan tersebut diiktiraf melalui Penyata Aset Bersih, kecuali kerugian rosot nilai, kerugian dan keuntungan pertukaran mata wang asing atas instrumen kewangan dan faedah yang dikira di bawah kaedah faedah efektif.

Pelaburan dalam instrumen ekuiti di mana nilai saksama tidak boleh dinilai dengan yakin dinyatakan pada nilai kos setelah ditolak kerugian rosot nilai.



## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IV). Liabiliti Kewangan

Liabiliti Kewangan diiktiraf dalam Penyata Kedudukan Kewangan apabila Suruhanjaya menjadi pihak kepada peruntukan kontrak instrumen.

Pada pengiktirafan awal, Liabiliti Kewangan adalah diukur pada nilai saksama, termasuk kos urus niaga untuk Liabiliti Kewangan yang tidak diukur pada nilai saksama menerusi lebihan atau kurangan, yang terlibat secara langsung di dalam menerbitkan Liabiliti Kewangan.

Selepas pengiktirafan awal, Liabiliti Kewangan dikelaskan kepada salah satu daripada dua kategori Liabiliti Kewangan iaitu Liabiliti Kewangan diukur pada nilai saksama menerusi lebihan atau kurangan, pinjaman dan belum bayar.

Suruhanjaya mempunyai kategori Liabiliti Kewangan seperti berikut:

##### Pinjaman dan Belum bayar

Selepas pengiktirafan awal, Pinjaman dan Belum Bayar adalah diukur pada kos dilunaskan menggunakan kaedah faedah efektif. Keuntungan atau kerugian diiktiraf di dalam lebihan atau kurangan apabila Liabiliti Kewangan dinyahiktiraf atau dirosotnilai.

Liabiliti Kewangan dinyahiktiraf apabila obligasi yang dinyatakan dalam kontrak telah dilepaskan, dibatalkan atau tamat tempoh.

Sebarang perbezaan di antara nilai dibawa Liabiliti Kewangan yang dinyahiktiraf dan pertimbangan dibayar adalah diiktiraf di dalam lebihan atau kurangan dalam tempoh penyahiktirafan.

##### (V). Pertimbangan Perakaunan Kritikal dan Ketidakpastian dalam Sumber Utama Anggaran

Tiada sebarang pertimbangan perakaunan kritikal dan ketidakpastian dalam sumber utama anggaran yang digunakan ketika menyediakan Penyata Kewangan Suruhanjaya yang mempunyai kesan ketara ke atas jumlah yang dilaporkan selain yang dinyatakan di bawah:

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IV). Pertimbangan Perakaunan Kritikal dan Ketidakpastian dalam Sumber Utama Anggaran...sambungan

(a). Elaun Rosot Nilai bagi Belum Terima

Suruhanjaya menilai pada setiap tarikh pelaporan sama ada terdapat sebarang bukti objektif bahawa Aset Kewangan terjejas. Untuk menentukan sama ada terdapat bukti objektif rosot nilai, Suruhanjaya menganggap faktor seperti ketidakmampuan bayar si berhutang dan keingkaran atau kelewatan pembayaran yang ketara. Jika terdapat bukti potensi hutang tak mampu dibayar, jumlah dan masa aliran tunai masa hadapan dianggarkan berdasarkan sejarah pengalaman kerugian untuk aset yang mempunyai ciri-ciri risiko kredit yang serupa.

(b). Perubahan Anggaran Jangka Hayat bagi Hartanah, Kelengkapan dan Peralatan

Semua Hartanah, Kelengkapan dan Peralatan disusutnilaikan mengikut kaedah garis lurus sepanjang jangka hayat aset tersebut. Perubahan dalam anggaran corak penggunaan aset dan pembangunan teknologi boleh memberi kesan kepada jangka hayat dan nilai sisa aset tersebut. Ini akan menyebabkan susut nilai aset pada masa hadapan akan disemak semula.

(c). Pengukuran Peruntukan

Suruhanjaya sentiasa menggunakan anggaran terbaik sebagai asas untuk mengukur suatu peruntukan itu. Anggaran itu dibuat berdasarkan kepada pengalaman lalu, lain-lain petunjuk atau andaian, perkembangan terkini dan peristiwa masa hadapan yang munasabah dalam menentukan suatu peruntukan.

## SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (V). Penjejasan Aset Bukan Kewangan

###### (a). Penjejasan Nilai Aset Menjana Tunai

Pada setiap tarikh Penyata Kedudukan Kewangan, Suruhanjaya mengkaji semula nilai dibawa aset-asetnya bagi menentukan sama ada terdapat sebarang petunjuk kemerosotan nilai. Jika wujud sebarang petunjuk, rosot nilai dikira dengan membandingkan nilai dibawa aset dengan amaun boleh pulih. Amaun boleh pulih adalah nilai tertinggi di antara nilai saksama ditolak kos untuk dijual dan nilai dalam penggunaan.

Dalam menentukan nilai dalam penggunaan aliran tunai masa hadapan akan didiskaunkan kepada nilai semasanya menggunakan kadar diskaun sebelum cukai yang menggambarkan nilai pasaran semasa nilai masa wang dan risiko khusus kepada aset tersebut. Di dalam menentukan nilai saksama ditolak kos untuk dijual pula, urus niaga pasaran terkini akan diambil kira, jika ada. Jika tiada urus niaga pasaran terkini berlaku, model penilaian yang sesuai hendaklah digunakan.

Kerugian kemerosotan diiktiraf sebagai perbelanjaan dalam Penyata Prestasi Kewangan serta-merta apabila nilai dibawa aset melebihi amaun boleh pulihnya.

Kerugian kemerosotan nilai yang diiktiraf dalam tempoh terdahulu bagi sesuatu aset hendaklah dibalikkan jika, dan hanya jika terdapat perubahan dalam anggaran yang digunakan untuk menentukan amaun boleh pulih. Pembalikan tersebut diiktiraf dalam Penyata Prestasi Kewangan.

###### (b). Penjejasan Nilai Aset Bukan Menjana Tunai

Suruhanjaya akan menilai pada setiap tarikh pelaporan sama ada terdapat petunjuk bahawa Aset Penajaan Bukan Tunai mungkin terjejas. Jika sebarang petunjuk wujud, maka Suruhanjaya akan membuat anggaran ke atas jumlah perkhidmatan boleh pulih aset. Jumlah perkhidmatan boleh pulih aset adalah nilai tertinggi di antara nilai saksama ditolak kos untuk dijual dan nilai dalam penggunaan.

Kerugian kemerosotan diiktiraf sebagai perbelanjaan dalam Penyata Prestasi Kewangan serta-merta apabila nilai dibawa aset melebihi jumlah perkhidmatan boleh pulihnya.

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (V). Penjejasan Aset Bukan Kewangan...sambungan

###### (b). Penjejasan Nilai Aset Bukan Menjana Tunai...sambungan

Dalam menentukan nilai dalam penggunaan, Suruhanjaya telah mengguna pakai pendekatan kos penggantian yang disusut nilai. Di dalam pendekatan ini, nilai semasa baki potensi perkhidmatan aset ditentukan sebagai kos penggantian aset yang telah disusut nilai.

Kos penggantian yang disusut nilai akan diukur dengan mengambil kira kos penggantian aset ditolak susut nilai terkumpul yang dikira atas kos itu bagi mencerminkan potensi perkhidmatan aset yang telah digunakan atau sudah luput.

Dalam menentukan nilai saksama ditolak kos untuk dijual pula, harga aset dalam perjanjian yang mengikat akan dilaraskan dengan harga pelupusan aset tersebut. Jika tiada perjanjian yang mengikat, tetapi aset tersebut diniagakan di pasaran secara aktif, maka nilai saksama ditolak kos untuk dijual adalah ditentukan dengan merujuk kepada nilai pasaran terkini ditolak kos pelupusan. Jika tiada perjanjian jual yang mengikat atau pasaran aktif bagi aset, Ahli Lembaga menentukan nilai saksama ditolak kos untuk menjual berdasarkan maklumat yang ada yang terbaik.

Bagi setiap aset, penilaian dibuat pada setiap tarikh laporan sama ada terdapat sebarang petunjuk yang sebelum ini kerugian rosot nilai yang diiktiraf mungkin tidak lagi wujud atau telah berkurangan. Jika petunjuk sedemikian wujud, Suruhanjaya menganggarkan jumlah perkhidmatan boleh pulih aset. Kerugian kemerosotan nilai yang diiktiraf sebelumnya dibalikkan hanya jika terdapat perubahan dalam andaian yang digunakan untuk menentukan jumlah perkhidmatan boleh pulih aset sejak kerugian kemerosotan nilai terakhir diiktiraf. Pembalikan adalah terhad setakat nilai dibawa aset tidak melebihi jumlah perkhidmatan boleh pulih atau tidak melebihi nilai dibawa yang mungkin setelah susut nilai terkumpul seperti tiada kerugian kemerosotan nilai diiktiraf bagi aset tersebut dalam tahun sebelumnya. Pembalikan tersebut diiktiraf dalam Penyata Prestasi Kewangan.



## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IV). 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.

##### (V). 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.

##### (VI). 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 Sumber Asli, Alam Sekitar dan Perubahan Iklim (NRECC) dan Agensi Kerajaan bagi tujuan-tujuan yang khusus.

##### (VII). 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 Penyata Kedudukan Kewangan.

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IX). Percukaian...sambungan

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 Penyata Kedudukan Kewangan, 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 dibawa dalam penyata kewangan. Perbezaan bersifat sementara tidak diiktiraf bagi muhibah, yang tidak dibenarkan bagi tujuan percukaian, dan pada permulaan pengiktirafan aset atau tanggungan di mana 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 dibawa aset dan tanggungan, menggunakan kadar cukai diwartakan atau sebahagian besarnya diwartakan pada tarikh Penyata Kedudukan Kewangan.

Aset cukai tertunda diiktiraf hanya pada mana ianya berkemungkinan keuntungan yang boleh dikenakan cukai di masa hadapan boleh diperolehi dari aset yang digunakan.

##### (X). Manfaat Pekerja

###### (a). 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. Pengiktirafan Gantian Cuti Rehat adalah menggunakan *Actuarial Valuation Method*. 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.

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IV). Manfaat Pekerja...sambungan

###### (a). Manfaat Pekerja Jangka Pendek...sambungan

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 dan diiktiraf secara akruan di dalam Penyata Prestasi Kewangan tahun semasa sebagai perbelanjaan dan di dalam Penyata Kedudukan Kewangan sebagai Liabiliti Semasa.

###### (b). Pelan Sumbangan Tetap

Mengikut undang-undang, majikan di Malaysia yang berkecualan diwajibkan memberi sumbangan tetap ke atas Kumpulan Wang Simpanan Pekerja dan PERKESO. Sumbangan tersebut diiktiraf sebagai perbelanjaan di dalam Penyata Prestasi Kewangan. Tanggungan untuk pelan sumbangan tetap, diiktiraf sebagai perbelanjaan semasa di dalam Penyata Prestasi Kewangan.

###### (c). Manfaat Pekerja Jangka Panjang

Manfaat Pekerja Jangka Panjang ialah pemberian faedah persaraan berbentuk Gantian Cuti Rehat dan 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 dan diiktiraf secara akruan dalam Penyata Prestasi Kewangan tahun semasa sebagai perbelanjaan dan di dalam Penyata Kedudukan Kewangan sebagai Liabiliti Bukan Semasa. Pengiktirafan dengan menggunakan *Actuarial Valuation Method*.

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (IV). Pengiktirafan Pendapatan

###### (a). Hasil daripada Urusniaga Pertukaran

Hasil daripada urusniaga pertukaran diiktiraf apabila terdapat kemungkinan bahawa manfaat ekonomi masa hadapan atau potensi perkhidmatan akan mengalir kepada entiti dan manfaat ini boleh diukur dengan pasti. Hasil daripada urusniaga pertukaran Suruhanjaya Tenaga adalah seperti berikut:

- (i). Pendapatan faedah bagi simpanan semasa di bank yang dikira berasaskan tunai.
- (ii). Pendapatan faedah daripada simpanan tetap di bank dengan tempoh matang tiga (3) bulan atau kurang dari tempoh pembelian diiktiraf atas dasar akruan.
- (iii). Pendapatan faedah daripada pelaburan jangka pendek yang mempunyai tempoh matang lebih dari tiga (3) bulan dan sehingga setahun diiktiraf atas dasar akruan.
- (iv). Lain-lain pendapatan yang terdiri daripada jualan dokumen tender, jualan buku-buku berkaitan industri, jualan aset tetap dan caj/penalti.

###### (b). Hasil daripada Urusniaga Bukan Pertukaran

Hasil daripada urusniaga bukan pertukaran akan diiktiraf sebagai aset apabila terdapat manfaat ekonomi masa depan atau potensi perkhidmatan dijangka mengalir ke dalam entiti, ianya berpunca daripada peristiwa lampau serta nilai saksama aset dapat diukur dengan munasabah.

Urusniaga bukan pertukaran yang diiktiraf sebagai aset hendaklah diiktiraf sebagai hasil, kecuali setakat liabiliti yang juga diiktiraf berkenaan dengan aliran masuk yang sama sebagai tertunda di dalam Penyata Kewangan.

Apabila obligasi terhadap sesuatu liabiliti itu telah dipenuhi, entiti hendaklah mengurangkan amaun bawaan liabiliti yang diiktiraf itu, dan mengiktiraf amaun hasil yang sama dengan pengurangan itu. Hasil daripada urusniaga bukan pertukaran Suruhanjaya Tenaga adalah seperti berikut:

- (i). Pendapatan daripada Pelesenan Awam dan Persendirian diambil kira mengikut asas tunai memandangkan tanggungjawab pembayaran tahunan adalah pada pemegang-pemegang lesen.

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (II). Pengiktirafan Pendapatan...sambungan

(b). Hasil daripada Urusniaga Bukan Pertukaran...sambungan

(ii). Pendapatan daripada Pendaftaran dan Pembaharuan Fi Operasi, serta Lain-Lain Fi Operasi diambil kira mengikut asas tunai.

##### (XII). 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.

##### (XIII). Peruntukan

Peruntukan diiktiraf apabila Suruhanjaya Tenaga mempunyai obligasi semasa yang konstruktif 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.

##### (XIV). Tukaran Wang Asing

Urus niaga yang dibuat dengan menggunakan mata wang asing telah ditukarkan kepada Ringgit Malaysia dengan kadar yang ditetapkan pada masa urus niaga dilaksanakan.



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### Nota-nota kepada Penyata Kewangan...sambungan

#### 3. Polisi Perakaunan...sambungan

##### (XV). Liabiliti dan Aset Luar Jangka

Liabiliti luar jangka adalah obligasi semasa yang tidak diiktiraf kerana tiada kebarangkalian aliran keluar sumber akan diperlukan untuk menyelesaikan obligasi atau dalam kes yang sangat jarang berlaku di mana liabiliti tidak dapat diiktiraf kerana ia tidak boleh diukur secara pasti. Liabiliti luar jangka tidak diiktiraf tetapi didedahkan dalam Nota 21 kepada Penyata Kewangan.

Obligasi yang muncul dari peristiwa yang lepas, yang kewujudannya hanya dapat disahkan melalui berlakunya atau tidak berlakunya satu atau lebih peristiwa akan datang yang belum pasti, tidak di bawah kawalan Suruhanjaya Tenaga juga didedahkan sebagai liabiliti luar jangka melainkan kebarangkalian aliran keluar sumber ekonomi adalah kecil.

Aset luar jangka adalah aset yang berkemungkinan wujud daripada peristiwa lalu yang kewujudannya akan hanya disahkan apabila berlaku atau tidak berlakunya satu atau lebih peristiwa yang tidak pasti pada masa hadapan yang bukan dalam kawalan penuh Suruhanjaya Tenaga.

Suruhanjaya Tenaga tidak mengiktiraf aset luar jangka dalam penyata kewangan tetapi mendedahkan kewujudannya di mana aliran masuk manfaat ekonomi adalah berkemungkinan, tetapi tidak pasti.

##### (XVI). Maklumat Bajet

Bajet tahunan disediakan pada asas tunai. Memandangkan penyata kewangan disediakan menggunakan asas akrual, maka satu Penyata Prestasi Bajet telah disediakan yang membandingkan bajet tahun semasa dan juga sebenar tahun semasa.

Penyata ini telah disediakan menggunakan asas penyediaan bajet tahunan dan hanya merujuk kepada bajet mengurus dan pembangunan. Jumlah bajet hanya dibentangkan bagi pihak Suruhanjaya Tenaga dan ia telah diluluskan oleh Menteri Tenaga dan Sumber Asli (kini dikenali sebagai Menteri Sumber Asli, Alam Sekitar dan Perubahan Iklim).

**SURUHANJAYA TENAGA**

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**Nota-nota kepada Penyata Kewangan...sambungan****4. Tunai dan Kesetaraan Tunai**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Wang Tunai dan Saki di Bank	42,530,246	54,280,299
Deposit di Bank Berlesen	109,460,920	68,878,970
<b>JUMLAH</b>	<b>151,991,166</b>	<b>123,159,269</b>

Wang Tunai dan Baki di Bank adalah termasuk dana Kumpulan Wang Khas sebanyak RM2,326,682 (2021: RM5,706,219).

**5. Pelbagai Akaun Belum Terima, Deposit dan Pendahuluan**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Pendahuluan Kakitangan	4,373	-
Deposit Keahlian Kelab	92,000	92,000
Lain-lain deposit dan Penghutang	573,636	577,336
<b>JUMLAH</b>	<b>670,009</b>	<b>669,336</b>

Lain-lain Deposit dan Pendahuluan adalah terdiri daripada deposit sewa pejabat kawasan, stor, dan tempat letak kenderaan serta deposit penggunaan fasiliti lain seperti deposit bagi perkhidmatan perubatan (*Third Party Administrator*), ruang iklan pejabat kawasan, elektrik dan lain-lain.

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 6. Pendapatan Faedah Belum Terima

	2022 RM	2021 RM
Hasil Faedah Terakru	3,428,328	2,255,183
<b>JUMLAH</b>	<b>3,428,328</b>	<b>2,255,183</b>

Pendapatan Faedah Belum Terima adalah faedah belum matang bagi simpanan tetap yang diambil kira sehingga 31 Disember setiap tahun.

#### 7. Cukai Terdahulu

	2022 RM	2021 RM
Bayaran CP500	4,105,545	4,341,376
Cukai Tahun Semasa	(3,647,676)	(3,107,083)
	457,869	1,234,293
Baki Cukai Terdahulu Tahun Sebelum	1,234,293	-
<b>JUMLAH</b>	<b>1,692,162</b>	<b>1,234,293</b>

**Nota-nota kepada Penyata Kewangan...sambungan**

**8. Hartanah, Kelengkapan dan Peralatan 2022**

	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
<b>Kos</b>								
Pada 1 Januari	8,299,405	79,205,160	4,144,439	7,232,401	5,335,731	5,552,560	1,585,140	111,354,836
Penambahan	-	-	405,492	157,835	255,158	661,560	-	1,480,045
Pelupusan/Pindahan	-	-	-	-	-	(21,120)	-	(21,120)
Pada 31 Disember	8,299,405	79,205,160	4,549,931	7,390,236	5,590,889	6,193,000	1,585,140	112,813,761
<b>Susut Nilai Berkumpul</b>								
Pada 1 Januari	-	13,464,876	3,565,494	6,419,110	4,822,964	4,871,067	1,551,709	34,695,220
Susut Nilai Tahun Semasa	-	1,584,103	214,624	312,342	172,678	466,932	11,000	2,761,679
Pelupusan/Pindahan	-	-	-	-	-	(21,116)	-	(21,116)
Pada 31 Disember	-	15,048,979	3,780,118	6,731,452	4,995,642	5,316,883	1,562,709	37,435,783
<b>Nilai Buku Bersih</b>								
Pada 31 Disember	8,299,405	64,156,181	769,813	658,784	595,247	876,117	22,431	75,377,978

# SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

## Nota-nota kepada Penyata Kewangan...sambungan

### 8. Hartanah, Kelengkapan dan Peralatan 2021

	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
<b>Kos</b>								
Pada 1 Januari	8,299,405	79,205,160	4,144,439	7,052,286	5,358,021	5,167,648	1,580,140	110,807,099
Penambahan	-	-	-	180,115	173,590	389,911	5,000	748,616
Pelupusan/Pindahan	-	-	-	-	(195,880)	(4,999)	-	(200,879)
Pada 31 Disember	8,299,405	79,205,160	4,144,439	7,232,401	5,335,731	5,552,560	1,585,140	111,354,836
<b>Susut Nilai Terkumpul</b>								
Pada 1 Januari	-	11,880,773	3,342,073	6,024,966	4,837,381	4,344,647	1,541,625	31,971,465
Susut Nilai Tahun Semasa	-	1,584,103	223,421	394,144	181,454	531,418	10,084	2,924,624
Pelupusan/Pindahan	-	-	-	-	(195,871)	(4,998)	-	(200,869)
Pada 31 Disember	-	13,464,876	3,565,494	6,419,110	4,822,964	4,871,067	1,551,709	34,695,220
<b>Nilai Buku Bersih</b>								
Pada 31 Disember	8,299,405	65,740,284	578,945	813,291	512,767	681,493	33,431	76,659,616



**SURUHANJAYA TENAGA**

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

**Nota-nota kepada Penyata Kewangan...sambungan****9. Pelbagai Akaun Belum Bayar dan Perbelanjaan Terakru**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Akaun Belum Bayar	9,765	294,736
Akaun Belum Bayar Terakru	15,270,182	14,593,906
Kompaun Kumpulan Wang Disatukan di bawah NRECC	27,000	-
Yuran Audit	50,562	50,562
<b>JUMLAH</b>	<b>15,357,509</b>	<b>14,939,204</b>

Akaun Belum Bayar dan Belum Bayar Terakru adalah tidak dikenakan faedah dan pada kebiasaannya diselesaikan atas terma 30 hari.

**10. Peruntukan Manfaat Pekerja**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Pada 1 Januari	20,151,072	19,227,195
Peruntukan bagi Tahun Semasa	7,421,440	3,811,684
Bayaran pada Tahun Semasa	(4,162,358)	(2,887,807)
Pada 31 Disember	<b>23,410,154</b>	<b>20,151,072</b>

Struktur kematangan Peruntukan Manfaat Pekerja adalah seperti berikut:

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Matang dalam Tempoh 12 Bulan	3,282,678	4,024,349
Matang dalam Tempoh Melebihi 12 bulan	20,127,476	16,126,723
<b>JUMLAH</b>	<b>23,410,154</b>	<b>20,151,072</b>

## SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

### Nota-nota kepada Penyata Kewangan...sambungan

#### 10. Peruntukan Manfaat Pekerja...sambungan

Andaian Aktuari yang digunakan untuk pengiraan Peruntukan Manfaat Pekerja bagi Gratuiti adalah menggunakan kadar purata kenaikan gaji tahunan iaitu 5.0% (2021: 7.5%) dan kadar purata diskaun iaitu 4.29% (2021: 4.17%) manakala pengiraan bagi Gantian Cuti Rehat adalah menggunakan kadar purata kenaikan gaji tahunan iaitu 5.0% dan kadar purata diskaun iaitu 4.26%.

#### 11. Kumpulan Wang Khas

##### 2022

	Akaun Wang Khas PPKTL	Akaun Wang Khas MyPower	Akaun Wang Khas PR&PLL	Akaun Wang Khas MEIH dan MyEnergy Stats	Jumlah
	RM	RM	RM	RM	RM
Baki pada 1 Januari 2022	<b>158,547</b>	<b>1,968</b>	<b>5,545,704</b>	-	<b>5,706,219</b>
Pendapatan:					
Pemberian Kerajaan/Agensi	-	-	-	153,000	<b>153,000</b>
Faedah Bank	1,603	3	51,724	19	<b>53,349</b>
	1,603	3	51,724	153,019	<b>206,349</b>
(-) Perbelanjaan					
Caj bank	-	(10)	-	-	<b>(10)</b>
Perbelanjaan/Pelunasan dalam tahun	(94,400)	-	(3,491,476)	-	<b>(3,585,876)</b>
	(94,400)	(10)	(3,491,476)	-	<b>(3,585,886)</b>
(Kurangan)/Lebihan	(92,797)	(7)	(3,439,752)	153,019	<b>(3,379,537)</b>
<b>Baki pada 31 Disember 2022</b>	<b>65,750</b>	<b>1,961</b>	<b>2,105,952</b>	<b>153,019</b>	<b>2,326,682</b>

**SURUHANJAYA TENAGA**Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)**Nota-nota kepada Penyata Kewangan...sambungan****11. Kumpulan Wang Khas...sambungan****2021**

	Akaun Wang Khas PPKTL	Akaun Wang Khas MyPower	Akaun Wang Khas PR&PLL	Jumlah
	RM	RM	RM	RM
Baki pada 1 Januari 2021	<b>156,960</b>	<b>1,975</b>	<b>5,588,544</b>	<b>5,747,479</b>
Pendapatan:				
Faedah Bank	1,587	3	55,822	<b>57 412</b>
	1,587	3	55,822	<b>57 412</b>
(-) Perbelanjaan				
Caj bank	-	(10)	(2)	<b>(12)</b>
Perbelanjaan/Pelunasan dalam tahun	-	-	(98,660)	<b>(98,660)</b>
	-	(10)	(98,662)	<b>(98,672)</b>
Lebihan/ (Kurangan)	1,587	(7)	(42,840)	<b>(41,260)</b>
<b>Baki pada 31 Disember 2021</b>	<b>158,547</b>	<b>1,968</b>	<b>5,545,704</b>	<b>5,706,219</b>

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 Sumber Asli, Alam Sekitar dan Perubahan Iklim (NRECC) 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 untuk 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. Sebanyak RM94,400 telah dibelanjakan pada tahun 2022 untuk program Minggu Kecekapan dan Konservasi Tenaga (EECW).
- (ii). **Akaun Wang Khas MyPower:** bertujuan membiayai pelaksanaan inisiatif bagi projek di bawah RMKe-10 iaitu *Stabilization 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. Pada tahun 2022, sebanyak RM3,491,476 telah disalurkan kepada Sustainable Energy Development Authority (SEDA) untuk pelaksanaan projek Retrofit Kecekapan Tenaga seperti yang diluluskan oleh Kementerian Tenaga dan Sumber Asli (kini dikenali sebagai Kementerian Sumber Asli, Alam Sekitar dan Perubahan Iklim).

## SURUHANJAYA TENAGA

Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)

### Nota-nota kepada Penyata Kewangan...sambungan

#### 11. Kumpulan Wang Khas...sambungan

(iv). Akaun Wang Khas MEIH dan MyEnergyStats: peruntukan diperolehi daripada AAIBE untuk membiayai projek penambahbaikan portal *Malaysia Energy Hub* (MEIH) dan Aplikasi Mobile MyEnergyStats yang bermula pada 1 Oktober 2022.

#### 12. Yuran dan Caj

	2022 RM	2021 RM
Pelesenan Awam dan Persendirian	95,353,682	80,184,691
Pendaftaran/Pembaharuan Fi Operasi	34,913,740	31,858,360
Lain-lain Fi Operasi	1,085,471	702,116
<b>JUMLAH</b>	<b>131,352,893</b>	<b>112,745,167</b>

#### 13. Gaji, Elaun dan Manfaat Pekerja

	2022 RM	2021 RM
Gaji dan Elaun Kakitangan	40,714,348	38,999,966
Elaun Anggota Suruhanjaya Tenaga	663,224	801,438
Sumbangan Berkanun	8,240,223	8,842,554
Faedah Kewangan Yang Lain	20,531,387	14,768,532
<b>JUMLAH</b>	<b>70,149,182</b>	<b>63,412,490</b>

Bilangan kakitangan Suruhanjaya Tenaga pada 31 Disember 2022 adalah seramai 369 orang. Manakala, bilangan kakitangan untuk tahun 2021 adalah seramai 372 orang. Bilangan Anggota Suruhanjaya Tenaga bagi tahun 2022 adalah seramai 9 orang manakala pada tahun 2021 adalah seramai 10 orang. Sumbangan Berkanun adalah merangkumi caruman kepada Kumpulan Wang Simpanan Pekerja (KWSP) berjumlah RM7,921,614 (2021: RM8,530,565), Pertubuhan Keselamatan Sosial (PERKESO) berjumlah RM313,119 (2021: RM293,918) dan Kumpulan Wang Persaraan (Diperbadankan) berjumlah RM5,490 (2021: RM18,071).

**SURUHANJAYA TENAGA**Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)**Nota-nota kepada Penyata Kewangan...sambungan****14. Penyenggaraan**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Penyenggaraan Sistem Aplikasi	4,788,758	4,095,203
Penyenggaraan Alatan, Kenderaan dan Bangunan Pejabat	2,382,354	2,015,130
<b>JUMLAH</b>	<b>7,171,112</b>	<b>6,110,333</b>

**15. Perkhidmatan Ikhtisas**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Fi Audit	50,562	50,562
Fi Profesional dan Konsultan	7,270,388	8,778,550
Pembangunan Kompetensi dan Pengurusan Prestasi	705,415	1,035,863
Perbelanjaan-perbelanjaan lain	1,599,178	566,462
<b>JUMLAH</b>	<b>9,625,543</b>	<b>10,431,437</b>

**16. Perbelanjaan Lain**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Kumpulan Wang Disatukan Persekutuan	5,250,000	-
<i>Touch point</i>	305,213	211,013
Tanggungjawab Sosial Korporat	246,980	511,951
<i>Energy Efficiency Challenge</i>	137,395	108,750
	<b>5,939,588</b>	<b>831,714</b>

Perbelanjaan Lain merangkumi perbelanjaan sumbangan atau penajaan yang dibuat oleh Suruhanjaya Tenaga.



## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 17. Cukai

	2022 RM	2021 RM
<b>Perbelanjaan Cukai</b>		
Tahun Semasa	<u>3,647,676</u>	<u>3,107,083</u>
<b>Penyesuaian Kadar Cukai Efektif</b>		
Lebihan Pendapatan Sebelum Cukai	38,589,462	32,930,117
Cukai pada Kadar 30%	11,576,839	9,879,035
Pendapatan yang Dikecualikan Cukai	<u>(7,929,163)</u>	<u>(6,771,952)</u>
<b>Perbelanjaan Cukai</b>	<u><b>3,647,676</b></u>	<u><b>3,107,083</b></u>

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.

**SURUHANJAYA TENAGA**Ditubuhkan di bawah Akta Suruhanjaya Tenaga 2001 (Akta 610) dan  
Akta Suruhanjaya Tenaga (Pindaan) 2010 (Akta A1371)**Nota-nota kepada Penyata Kewangan...sambungan****18. Maklumat Perbandingan**

	Sebelum RM	Reklasifikasi RM	Selepas RM
<b><u>Kesan ke atas Penyata Kedudukan Kewangan bagi Tahun Berakhir 31 Disember 2021</u></b>			
<u>Liabiliti Semasa</u>			
Pelbagai Akaun Belum Bayar dan Perbelanjaan Terakru	17,734,463	(2,795,259)	14,939,204
Peruntukan Manfaat Pekerja Jangka Pendek	3,735,555	288,794	4,024,349
<u>Liabiliti Bukan Semasa</u>			
Peruntukan Manfaat Pekerja Jangka Panjang	13,620,258	2,506,465	16,126,723
<b><u>Kesan ke atas Penyata Aliran Tunai bagi Tahun Berakhir 31 Disember 2021</u></b>			
Peruntukan Manfaat Pekerja	3,103,377	708,307	3,811,684
Peningkatan di dalam Pelbagai Akaun Belum Bayar dan Tanggungan Terakru	2,227,026	(649,990)	1,577,036
Bayaran Manfaat Pekerja	(2,829,490)	(58,317)	(2,887,807)

Reklasifikasi daripada Pelbagai Akaun Belum Bayar kepada Peruntukan Manfaat Pekerja Jangka Pendek dan Peruntukan Manfaat Pekerja Jangka Panjang adalah untuk Peruntukan Gantian Cuti Rehat berdasarkan *Actuarial Valuation Method*.

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 19. Maklumat Bajet

Bajet Suruhanjaya Tenaga diluluskan oleh Kementerian Sumber Asli, Alam Sekitar dan Perubahan Iklim untuk meliputi tempoh fiskal bermula dari 1 Januari 2022 hingga 31 Disember 2022.

Berikut adalah perbezaan material bagi perbelanjaan tertentu di antara amaun Bajet dan Sebenar pada tahun 2022:

Perihal	Sebenar 2022	Bajet Akhir 2022	Perbezaan Bajet Akhir dengan Sebenar
	RM	RM	RM
<b><u>HASIL</u></b>			
Hasil Operasi	131,352,893	117,191,852	14,161,041
Pendapatan Faedah, Keuntungan Hibah dan Lain-lain Pendapatan	12,547,876	9,524,000	3,023,876
<b><u>PERBELANJAAN</u></b>			
Emolumen	70,092,812	71,928,000	1,835,188
Bekalan Pejabat	729,275	1,843,200	1,113,925
Penyenggaraan	5,151,426	8,185,263	3,033,837
Perkhidmatan Iktis	10,298,167	20,828,512	10,530,345
Perbelanjaan Lain	5,919,608	12,085,000	6,165,392
Aset	906,639	1,950,000	1,043,361

Kutipan hasil daripada Pelesenan Awam Elektrik dan Gas menyumbang kepada peningkatan Hasil Operasi sebenar bagi tahun 2022 berbanding bajet akhir manakala peningkatan Pendapatan Faedah tahun 2022 berbanding bajet akhir tahun 2022 adalah kerana kadar hibah simpanan tetap yang meningkat selaras dengan peningkatan Kadar Dasar Semalaman (OPR).

Perbezaan Bajet Akhir dengan Bajet Asal tahun 2022 adalah setelah mengambil kira pindahan bajet yang dibenarkan berdasarkan Had Kuasa Kewangan dan Manual Prosedur Kewangan Suruhanjaya Tenaga (Pindaan 2017). Pindahan bajet dibuat berdasarkan keperluan aktiviti-aktiviti dan operasi Suruhanjaya Tenaga bagi perbelanjaan Bekalan Pejabat, Penyenggaraan dan Perkhidmatan Iktis. Bagaimanapun, jumlah pindahan bajet adalah mengikut keperluan dan tidak melebihi jumlah keseluruhan bajet yang telah diluluskan untuk tahun 2022.

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 19. Maklumat Bajet...sambungan

Perbezaan bajet akhir dengan perbelanjaan sebenar di bawah Emolumen adalah untuk lebih bajet ke atas elaun mesyuarat dan elaun lebih masa kakitangan di mana perbelanjaan tersebut dibuat mengikut keperluan manakala sebahagian daripada baki bajet akhir Bekalan Pejabat direkodkan sebagai komitmen bagi sejumlah Pesanan Tempatan yang masih belum selesai.

Perbezaan perbelanjaan sebenar tahun 2022 dengan bajet akhir bagi Penyenggaraan dan Perkhidmatan Iktis adalah kerana terdapat kerja-kerja penyenggaraan bangunan dan sistem aplikasi serta projek pembangunan yang dilaksanakan mengikut kemajuan dan baki kerja yang belum selesai direkodkan sebagai Komitmen.

Perbezaan perbelanjaan sebenar tahun 2022 dengan bajet akhir bagi Perbelanjaan Lain disebabkan oleh terdapat bajet tambahan bagi Sumbangan kepada Kumpulan Wang Disatukan Persekutuan seperti yang telah diluluskan oleh NRECC manakala baki Bajet Akhir adalah termasuk perbelanjaan sumbangan kepada KWDP tahun 2022 dan sumbangan *Touch Point* berjumlah RM5,370,000 dan direkodkan sebagai Komitmen.

Perbelanjaan Aset adalah mengikut keperluan dan sebahagian daripada baki bajet akhir Aset direkodkan sebagai Komitmen bagi perolehan aset yang masih belum selesai.

## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 20. Komitmen

	2022 RM	2021 RM
Hartanah, Kelengkapan dan Peralatan	790,706	582,086
Perkhidmatan lkhtisas	15,589,571	12,643,280
Bekalan Pejabat dan Penyenggaraan	1,696,318	2,689,532
Perbelanjaan lain - Sumbangan	5,370,000	19,980
Emolumen	-	56,370
<b>JUMLAH</b>	<b>23,446,595</b>	<b>15,991,248</b>

Komitmen bagi tahun berakhir 31 Disember 2022 di bawah Hartanah, Kelengkapan dan Peralatan berjumlah RM790,706 adalah termasuk perolehan untuk 2 buah kenderaan, kelengkapan perabot dan peralatan elektronik. Perkhidmatan lkhtisas adalah terdiri daripada perkhidmatan bagi projek di bawah kajian dan pembangunan ST berjumlah RM14,421,639 dan lain-lain perkhidmatan pakar runding dan konsultasi berjumlah RM1,167,932.

Komitmen untuk Penyenggaraan bagi tahun berakhir 31 Disember 2022 adalah untuk aktiviti menyenggara dan khidmat sokongan sistem rangkaian ICT serta penyenggaraan bangunan adalah berjumlah RM1,307,630 manakala kos Bekalan Pejabat berjumlah RM388,688. Selain itu, terdapat juga Komitmen untuk Sumbangan Kumpulan Wang Disatukan Persekutuan (KWDP) dan *Touch Point* berjumlah RM5,370,000.

Jumlah Komitmen bagi tahun 2021 sebanyak RM15,991,248 meliputi kos berkaitan Hartanah, Kelengkapan dan Peralatan, Perkhidmatan lkhtisas, Utiliti, Penyenggaraan, Bekalan Pejabat, Sumbangan dan Emolumen.



## SURUHANJAYA TENAGA

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### Nota-nota kepada Penyata Kewangan...sambungan

#### 21. Liabiliti Luar Jangka

(I). Perbadanan Pengurusan Solaris Dutamas

Suatu Saman Pemula telah difailkan di Mahkamah Tinggi Kuala Lumpur terhadap Suruhanjaya Tenaga (ST) dan Gas Malaysia Berhad (GMB) oleh Perbadanan Pengurusan Solaris Dutamas (Solaris) pada 12 Disember 2019 yang mendakwa tindakan ST mengenakan kewajipan kepada Solaris untuk memohon lesen peruncitan gas di bawah Akta Bekalan Gas 1993 [Akta 501] bagi membekalkan gas asli kepada kawasan pembangunan dan menyelenggara saluran paip pengguna adalah *ultra vires* Akta Pengurusan Strata 2013. Pada 27 Ogos 2020, Mahkamah Tinggi telah menolak Saman Pemula yang difailkan Solaris dengan kos. Solaris telah membuat rayuan kepada Mahkamah Rayuan dan rayuan tersebut dibenarkan pada 1 Oktober 2021. ST telah memfailkan kes ini di Mahkamah Persekutuan. Seterusnya, pada 6 Disember 2022 kes ini telah didengar di Mahkamah Persekutuan dan Mahkamah telah menolak rayuan ST dan GMB.

(II). Strong Elegance Sdn Bhd

Pada 18 Disember 2020, suatu tindakan sivil telah difailkan di Mahkamah Tinggi Kuala Lumpur terhadap ST oleh Strong Elegance Sdn Bhd (SE) untuk deklarasi bahawa penarikan balik surat lantikan untuk projek *Large Scale Solar* bertarikh 2 Mei 2017 oleh ST adalah tidak sah dan menuntut ganti rugi bagi semua kos dan perbelanjaan yang ditanggung oleh SE akibat penarikan surat lantikan tersebut termasuk ganti rugi umum dan ganti rugi teladan untuk dinilai oleh Mahkamah. Kes kini diperingkat pihak-pihak untuk memfailkan hujahan bertulis dan keputusan Mahkamah. Pada 15 Mac 2023, Hakim Mahkamah Tinggi telah memutuskan bahawa suatu deklarasi diberikan untuk mengisytiharkan penarikan balik surat lantikan adalah menyalahi undang-undang, batal dan tidak sah dan satu kemungkiran kontrak. Hakim seterusnya menetapkan tarikh untuk perbicaraan taksiran ganti rugi pada 17 dan 20 Julai 2023.

Pihak ST telah memfailkan Notis Usul kepada Mahkamah Rayuan untuk penggantungan pelaksanaan pada 31 Mei 2023 dan telah memfailkan Notis Rayuan kepada Mahkamah Rayuan. Mahkamah telah menetapkan 3 Julai 2023 untuk Pengurusan Kes penggantungan pelaksanaan dan 27 Jun 2023 untuk Pengurusan Kes rayuan.



**CERTIFICATE OF THE AUDITOR GENERAL  
ON THE FINANCIAL STATEMENTS OF  
ENERGY COMMISSION  
FOR THE YEAR ENDED 31 DECEMBER 2022**

**Certificate on the Audit of the Financial Statements**

**Opinion**

I have authorised a private audit firm pursuant to Subsection 7 (3) of the Audit Act 1957 [Act 62] to undertake an audit of the Financial Statements of the Energy Commission. The financial statements comprise the Statement of Financial Position as at 31 December 2022 of the Energy Commission and the Statement of Financial Performance, Statement of Changes in Net Assets/Equity, Statement of Cash Flows and Statement of Budget Performance for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, as set out on pages 1 to 34.

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 2022, and of its financial performance and its cash flows for the year then ended in accordance with the Malaysian Public Sector Accounting Standards (MPSAS) and the Energy Commission Act 2001 [Act 610] and Energy Commission (Amendment) Act 2010 [Act A1371] requirements.

**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 my 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 the 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 the Malaysian Public Sector Accounting Standards (MPSAS) and the Energy Commission Act 2001 [Act 610] and Energy Commission (Amendment) Act 2010 [Act A1371] requirements. The Members of the Energy Commission are also responsible for such internal control as the Members of the Energy Commission determines 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 an 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 of 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 the Energy Commission's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required 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. However, future events or conditions may cause the Energy Commission to cease to continue as a going concern; and
- e. evaluate the overall presentation, structure and content of the Financial Statements of the Energy Commission, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

The Members of the Energy Commission have been informed regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I have identify during the audit.

**Other Matters**

This certificate is made solely to the Members of the Energy Commission in accordance with the Energy Commission Act 2001 [Act 610] and Energy Commission (Amendment) Act 2010 [Act A1371] requirements, and for no other purpose. I do not assume responsibility to any other person for the content of this certificate.



**(FARIZAH BINTI BERAM)**  
ON BEHALF OF AUDITOR GENERAL

PUTRAJAYA  
16 JUNE 2023

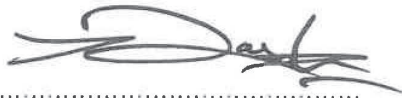




## STATEMENT OF CHAIRMAN AND A MEMBER OF THE ENERGY COMMISSION

We Mohammed Rashdan bin Mohd Yusof and Datuk Darryl Goon Siew Chye being the Chairman and one of the Members of the Energy Commission hereby declare, that in the opinion of the Members, the Financial Statements comprising the Statement of Financial Position, Statement of Financial Performance, Statement of Changes in Net Assets/Equity, Statement of Cash Flows, Statement of Budget Performance of the Energy Commission and the Notes to 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 2022 and of its results and changes in the financial position for the year ended on that date.

On behalf of the Members,



.....  
Mohammed Rashdan bin Mohd Yusof  
Chairman

Date: **16 JUN 2023**

Place: Energy Commission  
Precinct 2, Putrajaya

On behalf of the Members,



.....  
Datuk Darryl Goon Siew Chye  
Member

Date: **16 JUN 2023**


Place: Energy Commission  
Precinct 2, Putrajaya

**DECLARATION BY THE OFFICER PRIMARILY RESPONSIBLE  
FOR THE FINANCIAL MANAGEMENT  
OF THE ENERGY COMMISSION**

I, Dato' Ir. Ts. Abdul Razib bin Dawood, being the officer primarily responsible for the financial management and accounting records of the Energy Commission, solemnly declare that the Statement of Financial Position, Statement of Financial Performance, Statement of Changes in Net Assets/Equity, Statement of Cash Flows and the Statement of Budget Performance of the Energy Commission in the following financial position together with the Notes to the Financial Statements to the best of my knowledge and belief, correct and I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declaration Act 1960.

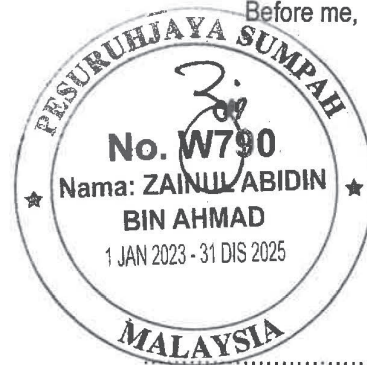
Subscribed and solemnly declared)

by the above-named )  
in **KUALA LUMPUR** )  
on **16 JUN 2023** )



.....

Before me,



No. 59, Jalan Telawi  
Bangsar Baru  
59100 Kuala Lumpur  
COMMISSIONER OF OATH

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### STATEMENT OF FINANCIAL POSITION As At 31 December 2022

	Note	2022 RM	2021 RM
<b>ASSETS</b>			
<b><u>Current Assets</u></b>			
Cash and Cash Equivalents	4	151,991,166	123,159,269
Short Term Investment		413,378,762	407,321,072
Other Receivables, Deposit and Advance	5	670,009	669,336
Accrued Interest Income	6	3,428,328	2,255,183
Tax in Advance	7	1,692,162	1,234,293
Total Current Assets		571,160,427	534,639,153
<b><u>Non-Current Assets</u></b>			
Property, Fittings and Equipment	8	75,377,978	76,659,616
<b>Total Assets</b>		<b>646,538,405</b>	<b>611,298,769</b>
<b>LIABILITIES</b>			
<b><u>Current Liabilities</u></b>			
Other Payables and Accrued Expenses	9	15,357,509	14,939,204
Provision for Short Term Employee Benefits	10	3,282,678	4,024,349
Special Funds	11	2,326,682	5,706,219
Total Current Liabilities		20,966,869	24,669,772
<b><u>Non-Current Liabilities</u></b>			
Provision for Long Term Employee Benefits	10	20,127,476	16,126,723
<b>Total Liabilities</b>		<b>41,094,345</b>	<b>40,796,495</b>
<b>Net Assets</b>		<b>605,444,060</b>	<b>570,502,274</b>
<b><u>NET ASSETS/EQUITIES</u></b>			
<b>Retained Profits</b>		<b>605,444,060</b>	<b>570,502,274</b>

The attached notes from pages 6 to 34 are an integral part of this Financial Statement.

**ENERGY COMMISSION**Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)**STATEMENT OF FINANCIAL PERFORMANCE  
For The Year Ended 31 December 2022**

	Note	2022 RM	2021 RM
<b>INCOME</b>			
<b>Income from Non-Exchangeable Transactions</b>			
Fees and Charges	12	131,352,893	112,745,167
<b>Income from Exchangeable Transactions</b>			
Interests		12,415,997	10,616,965
Other Income		131,879	40,395
<b>TOTAL INCOME</b>		<b>143,900,769</b>	<b>123,402,527</b>
<b>EXPENSES</b>			
Wages, Allowances and Employee Benefits	13	70,149,182	63,412,490
Traveling and Subsistence Allowances		2,850,449	455,733
Communications and Utilities		2,505,445	2,426,535
Rental		2,847,937	2,698,690
Hospitalities		420,576	233,121
Office Supplies		1,039,796	947,733
Maintenance	14	7,171,112	6,110,333
Professional Services	15	9,625,543	10,431,437
Depreciation of Property, Fittings and Equipment		2,761,679	2,924,624
Other Expenses	16	5,939,588	831,714
<b>TOTAL EXPENSES</b>		<b>(105,311,307)</b>	<b>(90,472,410)</b>
Profit Before Tax		38,589,462	32,930,117
Taxation Expense	17	(3,647,676)	(3,107,083)
<b>Profit for The Year</b>		<b>34,941,786</b>	<b>29,823,034</b>

The attached notes from pages 6 to 34 are an integral part of this Financial Statement.

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### STATEMENT OF CHANGES IN NET ASSETS/EQUITY For The Year Ended 31 December 2022

	<b>Total RM</b>
<b>2021</b>	
Balance as at 1 January	540,679,240
Surplus for the year	29,823,034
Balance as at 31 December	<u>570,502,274</u>
<b>2022</b>	
Balance as at 1 January	570,502,274
Surplus for the year	34,941,786
Balance as at 31 December	<u>605,444,060</u>

The attached notes from pages 6 to 34 are an integral part of this Financial Statement.



**ENERGY COMMISSION**Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)**STATEMENT OF CASH FLOWS**  
**For The Year Ended 31 December 2022**

	Note	2022 RM	2021 RM
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>			
Surplus of Income Before Tax		38,589,462	32,930,117
<b>Adjustments for Non-Cash Items:</b>			
Income from Interest Received		(12,415,997)	(10,616,965)
Depreciation of Property, Fittings and Equipment	8	2,761,679	2,924,624
Disposal of Property, Fittings and Equipment	8	4	10
Provisions for Employee Benefits	10	7,421,440	3,811,684
Operating Surplus Before Changes in Working Capital		36,356,588	29,049,470
Changes in Working Capital and Special Funds:			
(Increase) in Other Receivables and Accrued Interest Income		(1,173,818)	(104,487)
Increase in Other Payables and Accrued Liabilities		418,305	1,577,036
Government/Agency Allocations	11	153,000	-
Bank Interest from Special Funds	11	53,339	57,400
Expenditure of Special Funds	11	(3,585,876)	(98,660)
<b>Cash Flows from Operating Activities</b>		32,221,538	30,480,759
Tax Paid	7	(4,105,545)	(8,446,921)
Payment for Employee Benefits	10	(4,162,358)	(2,887,807)
<b>Net Cash Generated from Operating Activities</b>		<b>23,953,635</b>	<b>19,146,031</b>
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>			
Short Term Investment		(6,057,690)	(9,092,440)
Purchase of Property, Fittings and Equipment	8	(1,480,045)	(748,616)
Interest Income Received		12,415,997	10,616,965
<b>Net Cash from Investing Activities</b>		<b>4,878,262</b>	<b>775,909</b>
Net Increase in Cash and Cash Equivalents		28,831,897	19,921,940
<b>Cash and Cash Equivalents at The Beginning of The Year</b>		<b>123,159,269</b>	<b>103,237,329</b>
<b>Cash and Cash Equivalents at The End of The Year</b>	4	<b>151,991,166</b>	<b>123,159,269</b>

The attached notes from pages 6 to 34 are an integral part of this Financial Statement.

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### STATEMENT OF BUDGET PERFORMANCE For The Year Ended 31 December 2022

Actual 2021	Details	Actual 2022	Final Budget 2022	Original Budget 2022	Differences between Final Budget and Actual
RM		RM	RM	RM	RM
	<b><u>INCOME</u></b>				
112,745,167	Income from Operation	131,352,893	117,191,852	117,191,852	14,161,041
10,657,360	Interests Income, Profits from Hibah and Other Income	12,547,876	9,524,000	9,524,000	3,023,876
<b>123,402,527</b>	<b>Total Income</b>	<b>143,900,769</b>	<b>126,715,852</b>	<b>126,715,852</b>	<b>17,184,917</b>
	<b><u>EXPENSES</u></b>				
63,412,490	Emolument	70,092,812	71,928,000	71,928,000	1,835,188
455,733	Traveling and Subsistence Allowances	2,850,449	2,850,449	2,745,000	-
2,426,535	Communications and Utilities	2,505,445	3,150,000	3,150,000	644,555
2,698,690	Rental	2,847,937	3,530,000	3,530,000	682,063
233,121	Hospitality	420,576	420,576	260,000	-
654,046	Office Supplies	729,275	1,843,200	1,840,000	1,113,925
4,933,816	Maintenance	5,151,426	8,185,263	8,300,000	3,033,837
8,655,488	Professional Services	10,298,167	20,828,512	20,983,000	10,530,345
831,714	Other Expenses	5,919,608	12,085,000	6,835,000	6,165,392
211,017	Assets	906,639	1,950,000	1,950,000	1,043,361
<b>84,512,650</b>	<b>Total Expenses</b>	<b>101,722,334</b>	<b>126,771,000</b>	<b>121,521,000</b>	<b>25,048,666</b>
<b>38,889,877</b>	<b>Surplus/(Deficit)</b>	<b>42,178,435</b>	<b>(55,148)</b>	<b>5,194,852</b>	<b>(7,863,749)</b>

The attached notes from pages 6 to 34 are an integral part of this Financial Statement.

# ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

## 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 under the Energy Commission Act 2001 (Act 610) and the Energy Commission (Amendment) Act 2010 (Act A1371).

The Financial Statements were approved and certified for signature by the Energy Commission on 16 June 2023.

### 2. Basis of Preparation of Financial Statements

The Energy Commission's Financial Statements were prepared in compliance with the Malaysian Public Sector Accounting Standards (MPSAS). The Financial Statements were prepared based on the historical cost convention and generally accepted accounting practices in Malaysia. MPSAS 33 allows first-time adopters to recognize and measure certain Assets and Liabilities within the period of one (1) to three (3) years.

The Energy Commission adopted the following MPSAS beginning 1 January 2020 with initial transition date on 1 January 2019:

MPSAS 1: Presentation of Financial Statements

MPSAS 2: Cash Flow Statements

MPSAS 3: Accounting Policies, Changes in Accounting Estimates and Errors

MPSAS 4: The Effect of Changes in Foreign Exchange Rates

MPSAS 9: Revenue From Exchange Transactions

MPSAS 14: Events After The Reporting Date

MPSAS 17: Property, Plant and Equipment

MPSAS 19: Provisions, Contingent Liabilities and Contingent Assets

MPSAS 20: Related Party Disclosure

MPSAS 21: Impairment of Non-Cash-Generating Assets

MPSAS 22: Disclosure of Financial Information

MPSAS 23: Revenue From Non-Exchange Transactions (Taxes & Transfers)

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### Notes on the Financial Statements...continued

#### 2. Basis of Preparation of Financial Statements...continued

MPSAS 24: Presentation of Budget Information in Financial Statements

MPSAS 25: Employee Benefits

MPSAS 26: Impairment of Cash - Generating Assets

MPSAS 28: Financial Instruments - Presentation

MPSAS 29: Financial Instruments - Recognition and Measurement

MPSAS 30: Financial Instruments - Disclosure

MPSAS 33: First-Time Adoption of Accrual Basis MPSAS

The preparation of the Financial Statements requires management to make judgements, estimates and assumptions that affect the application of accounting policies and to report the amounts of assets, liabilities, income and expenses. Although judgements, estimates and assumptions are based on the best current knowledge and actions of 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

##### (I). Property, Fittings and Equipment

Property, Fittings and Equipment are stated at cost less accumulated depreciation and impairment, if any.

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.

**ENERGY COMMISSION**

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

**Notes on the Financial Statements...continued****3. Accounting Policies...continued****(IV). Property, Fittings and Equipment...continued**

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 utilizing the property and equipment.

**(V). Financial Asset**

Financial Asset is recognized in Statement of Financial Position when the Commission become a party to the contractual provisions of the instrument.

On initial recognition, financial assets are measured at fair value, plus transaction costs for financial assets not at 'fair value through profit or loss'.

After initial recognition, financial assets are classified into one of four categories: financial assets at 'fair value through profit or loss', 'held-to-maturity' investments, loans and receivables and 'available-for-sale' financial assets. The Commission did not have any financial assets other than loans and receivables.

Regular purchases and sales of financial assets are recognized on the trade-date, the date on which Commission commits to purchase or sell the asset.

Financial Asset Categories by the Commission are as below:

**(a). Loans and Receivables**

Loans and Receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. After initial recognition, the Financial Asset are then measured at amortized cost using the effective interest method less any accumulated impairment losses. Amortized cost is calculated by taking into account any discounts or premiums on the purchase of the asset as well as fees or costs which form a part of the effective interest rate. Losses arising from impairment are recognized in profit or loss. Loans and Receivables are classified as current assets except Loans and Receivables which the maturity date is more than 12 months after the reporting date which is classified as non-current assets.



## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (II). Financial Asset...continued

###### (b). Financial Asset on Fair Value Through Surplus or Deficit

For any embedded derivatives that cannot be valued reliably separately either on the acquisition date or at the end date of the next reporting period, the entire instrument is designated at Fair Value Through Surplus or Deficit. However, if the entire instrument cannot be measured reliably, the instrument is stated at cost less impairment.

Investments in equity instruments which fair value cannot be measured reliably are stated at cost less impairment losses.

###### (c). Investment Held Until Maturity

Non-derivative Financial Assets with a fixed or determinable payment maturity period and remain classified as held to maturity when the Commission has the positive intent and ability to hold until maturity. After initial measurement, held-to-maturity investments are measured at amortized cost using the effective interest method and less impairment. Amortization cost is calculated by taking into account any discounts or premiums on acquisition and fees or costs that form part of the effective interest rate. Losses arising from impairment are recognized in the Statement of Financial Performance.

The Commission will derecognize a Financial Asset or, if applicable, part of a Financial Asset or part of a group of Financial Assets when:

- (i). The right to receive cash flows from assets has expired or is excluded.
- (ii). The Commission has transferred its right to receive cash flows from assets or has accepted an obligation to pay the cash flows received in full without material delay to a third party; and whether: (i) the Commission has transferred substantially all the risks and rewards of the assets; or (ii) the Commission has not transferred or retained substantially all the risks and rewards of the asset, but has transferred control of the asset.

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (II). Financial Asset...continued

###### (c). Investment Held Until Maturity...continued

Any difference between the carrying amount of the derecognized Financial Asset and the consideration received is recognized in the Statement of Financial Performance in the period of derecognition.

###### (d). Available-for-Sale Financial Asset

Available-for-Sale Financial Asset is a Financial Asset that is designated as available for sale or is not classified in any other Financial Asset category. Subsequent to original recognition, available-for-sale Financial Assets are stated at fair value. Gains or losses on changes in the fair value of such Financial Assets are recognized through the Statement of Changes in Net Assets, except for impairment losses, gains and losses on foreign exchange upon financial instruments and interest calculated under the effective interest method.

Investments in equity instruments where fair value cannot be measured reliably are stated at cost less impairment losses.

##### (III). Financial Liabilities

Financial Liabilities are recognized in the Statement of Financial Position when the Commission becomes a party to the contractual provisions of the instrument.

On initial recognition, financial liabilities are measured at fair value, less transaction costs for financial liabilities not at 'fair value through profit or loss'.

Subsequent to initial recognition, Financial Liabilities are classified into one of two categories of Financial Liabilities which are Financial Liabilities measured at fair value through surplus or deficit, Loans and Receivables.

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (IV). Financial Liabilities...continued

The Commission has the following Financial Liabilities categories:

###### Loans and Receivables

Subsequent to initial recognition, Loans and Receivables are measured at amortized cost using the effective interest method. Gains or losses are recognized in surplus or deficit when the Financial Liabilities are derecognized or impaired.

Financial Liabilities are derecognized when the obligations specified in the contract are discharged, cancelled or expired.

Any difference between the carrying amount of the derecognized Financial Liabilities and the consideration paid is recognized in surplus or deficit in the period of derecognition.

##### (V). Critical Accounting Judgements and Uncertainties in the Primary Sources of Estimates

There are no critical accounting judgments and uncertainties in the primary sources of estimates used in preparing the Commission's Financial Statements that have a material effect on reported amounts other than those set out below:

###### (a). Impairment Receivables Allowances

The Commission assesses at each reporting date whether there is any objective evidence that Financial Assets are impaired. To determine whether there is objective evidence of impairment, the Commission considers factors such as insolvency of the debtor and default or significant late payment. If there is evidence of potential insolvency debt, the amount and timing of future cash flows are estimated based on historical loss experience for assets with similar credit risk characteristics.

###### (b). Changes in Estimated Lifespan of Property, Fittings and Equipment

All Property, Fittings and Equipment are depreciated on a straight-line basis over the life span of the asset. Changes in estimated patterns of asset utilization and technological

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### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (IV). Critical Accounting Judgements and Uncertainty in the Primary Sources of Estimates...continued

###### (b). Changes in Estimated Lifespan of Property, Fittings and Equipment...continued

development can affect the useful life and residual value of those assets. This will cause the depreciation of assets in the future to be reviewed.

###### (c). Allocation Measurement

The Commission always uses the best estimate as the basis for measuring a provision. The estimate is made based on past experience, other indications or assumptions, recent developments and reasonable future events in determining a provision.

##### (V). Impairment of Non-Financial Asset

###### (a). Impairment of Cash Generating Asset Value

At each date of Statement of Financial Position, the Commission reviews the carrying amounts of its assets to determine whether there is any indication of impairment. If any indication exists, impairment is calculated by comparing the asset's carrying amount with its recoverable amount. Recoverable amount is the highest of fair value less costs to sell and value in use.

In determining value in use future cash flows will be discounted to their present value using a pre-tax discount rate that reflects the current market value of the time value of money and the risks specific to the asset. In determining fair value less costs to sell, the latest market transactions will be taken into account, if any. If no recent market transactions occur, an appropriate valuation model should be used.

An impairment loss is recognized as an expense in the Statement of Financial Performance immediately when the carrying amount of the asset exceeds its recoverable amount.

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### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (V). Impairment of Non-Financial Asset...continued

###### (a). Impairment of Cash Generating Asset Value...continued

Impairment losses recognized in prior periods for an asset are reversed if, and only if, there is a change in the estimates used to determine the recoverable amount. The reversal is recognized in the Statement of Financial Performance.

###### (b). Impairment of non-cash-generating assets

The Commission will assess at each reporting date, whether there is any indication that Non-Cash Generating Assets may be impaired. If any indication exists, then the Commission will make an estimate of the amount of the asset's recoverable service. The asset's recoverable service amount is the highest amount of fair value less selling costs and value in use.

An impairment loss is recognized as an expense in the Statement of Financial Performance, immediately when the carrying value of the asset exceeds its recoverable amount.

In determining value in use, the Commission has adopted the depreciated replacement cost approach. In this approach, the present value of the asset's remaining service potential is determined as the replacement cost of the depreciated asset. Depreciated replacement cost is measured by taking into account the asset's replacement cost less accumulated depreciation calculated on that cost to reflect the service potential of the asset that has been used or has expired.

In determining the fair value less costs to sell, the price of the asset in the binding agreement is adjusted to determine the disposal price of the asset. If there is no binding agreement, but the asset is actively traded in the market, then the fair value less costs to sell is determined by reference to current market value less costs to dispose of. In the absence of a binding sale agreement or active market for the asset, the Board determines the fair value less costs to sell based on the best available information.

For each asset, an assessment is made at each reporting date as to whether there is any indication that a previously recognized impairment loss may no longer exist or has



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**Notes on the Financial Statements...continued****3. Accounting Policies...continued****(V). Impairment of Non-Financial Asset...continued**

(b). Impairment of non-cash-generating assets...continued

decreased. If such an indication exists, the Commission estimates the amount of the asset's recoverable service. A previously recognized impairment loss is reversed only if there has been a change in the assumptions used to determine the asset's recoverable amount of service since the last impairment loss was recognized. Reversals are limited to the extent that the carrying amount of the asset does not exceed the recoverable amount of service or does not exceed the carrying amount that would have been possible after accumulated depreciation as no impairment loss was recognized for the asset in the previous year. The reversal is recognized in the Statement of Financial Performance.

**(VI). 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 fluctuations.

The Cash Flow Statements are prepared using the indirect method.

**(VII). 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.

**(VIII). Special Funds**

Special Funds are provisions received from the Electricity Supply Industries Trust Fund (AAIBE) under the Ministry of Energy, Green Technology and Water (KeTTHA), which is currently administered by the Ministry of Energy and Natural Resources (KeTSA), and Government agencies for specific purposes.

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### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (IX). 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 recognized 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 recognized only when it is probable that taxable income surplus can be derived in the future from the assets used.

##### (X). Employee Benefits

###### (a). Short Term Employee Benefits

Wages, salaries and bonuses are recognized as expenses in the current year services performed by employees of the Energy Commission. Short term accumulated compensations such as paid annual leave are recognized when employees render services that increase their entitlement for paid leave in the future, and short term non-

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**Notes on the Financial Statements...continued****3. Accounting Policies...continued****(IV). Employee Benefits...continued****(a). Short Term Employee Benefits...continued**

accumulative compensations such as paid sick leave are only recognized when such leave of absence occur. The recognition of Provisions for Staff Leave is using the Actuarial Valuation Method. Medical facilities such as outpatient treatment facilities, hospitalization 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 recognized on an accrual basis in the current Statement of Income as an expense and in the Balance Sheet as Current Liabilities.

**(b). 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 recognized as expenses in the income statement. Liabilities for the compulsory contribution plans are recognized as current expenses in the income statement.

**(c). Long-Term Employee Benefits**

Long-Term Employee Benefits are the provision of retirement benefits in the form of Provisions for Staff Leave and Gratuity to the permanent staff serving for a minimum of ten years with the gratuity calculation rate as per approved by the Minister. It is considered as an employee's benefit payment; paid upon retirement and is recognized on an accrual basis in the current year's Statement of Financial Performance as expenses, and is stipulated as Non-Current Liabilities in the Balance Sheet. Recognition is by the use of Actuarial Valuation Method.

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### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (IV). Recognition of Income

###### (a). Income from Exchange Transactions

Income from exchange transactions is recognized when there is a probable future economic benefits or service potential will flow to the entity and these benefits can be measured reliably. The Energy Commission's income from exchange transactions are as follows:

- (i). Interest income from current account deposits in the bank calculated on cash basis.
- (ii). Interest income from fixed deposits in banks with a maturity period of three (3) months or less from the placement period is recognized on accrual basis.
- (iii). Interest income from short term investments in banks with a maturity of more than three (3) months and up to one (1) year from the placement period is recognized on accrual basis.
- (iv). Any other income from sale of tender documents, sale of industry-related books, sale of fixed assets and charges/penalties.

###### (b). Income from Non-Exchange Transactions

Income from non-exchange transactions is recognized as assets when there is a future economic benefits or service potential is expected flow to the entity, a result of past events and the fair value of the asset can be measured reliably.

Non-exchange transactions recognized as assets should also be recognized as income, except to the extent that liabilities are also recognized in respect of the same inflows as accrual in the Financial Statements.

When the obligation upon a liability has been fulfilled, the entity should reduce the carrying amount of the recognized liability, and recognized an amount of income which is equal to the reduction amount. The Energy Commission's income from non-exchange transactions are as follows:

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### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (III). Recognition of Income...continued

- (i). Income from Public and Private Licensing are accounted for on a cash basis since the annual payment responsibility under the license holders.
- (ii). Income from Registration and Renewal of Operating Fees, as well as Other Operating Fees are accounted for on a cash basis.

##### (XII). 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.

##### (XIII). 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.

##### (XIV). Foreign Exchange

Transactions made in foreign currencies are converted into Ringgit Malaysia based on the rate prescribed at the time of the transactions were executed.



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### Notes on the Financial Statements...continued

#### 3. Accounting Policies...continued

##### (XV). Contingent Liabilities and Contingent Assets

Contingent liabilities are current obligations which are not recognized as there is no probability of fund outflow is required to fulfill the obligation, or in extremely rare cases where a liability cannot be recognized as it cannot be measured reliably. Contingent liabilities are not recognized but are disclosed in Note 21 to the Financial Statements.

Obligations arising from past events of which the existence can only be confirmed through the occurrence or non-occurrence of one or more uncertain future events, and not under the control of the Energy Commission are also disclosed as contingent liabilities, unless the probability of economic resources outflow is small.

Contingent assets are assets that are likely to exist resulting from past events of which the existence will only be confirmed through the occurrence or non-occurrence of one or more uncertain future events and it is not under full control of the Energy Commission.

The Energy Commission does not recognize contingent assets in the financial statements but disclosed their existence where there is a probability of economic benefits inflow, but is not certain.

##### (XVI). Budget Information

The annual budget is prepared on a cash basis. Considering the financial statements is prepared on accrual basis, a Statement of Budget Performance being prepared to show the comparison between the current year budget and the current year's actual utilization.

This statement has been prepared using the annual budget preparation basis and only refers to the operational and development budget.

The total budget is only presented on behalf of the Energy Commission which it has been approved by the Ministry of Energy and Natural Resources (currently known as Ministry of Natural Resources, Environment and Climate Change).

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	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Cash and Bank Balances	42,530,246	54,280,299
Deposits in Licensed Bank	109,460,920	68,878,970
<b>TOTAL</b>	<b>151,991,166</b>	<b>123,159,269</b>

Cash and Bank Balances includes the Special Fund of RM2,326,682 (2021: RM5,706,219).

**5. Other Receivables, Deposit and Advance**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Staff Advance	4,373	-
Club Membership Deposits	92,000	92,000
Other Deposits and Receivables	573,636	577,336
<b>TOTAL</b>	<b>670,009</b>	<b>669,336</b>

Other Receivables, Deposit and Advance includes rental deposit for regional offices, stores, parking, other facilities used such as deposits for medical services (Third Party Administrator), advertisements spaces for regional offices, electricity, and others.

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### Notes on the Financial Statements...continued

#### 6. Accrued Interest Income

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Accrued Interest Income	3,428,328	2,255,183
<b>TOTAL</b>	<b>3,428,328</b>	<b>2,255,183</b>

Accrued Interest Income is the immature benefit of fixed deposits which is accounted for as at 31 December each year.

#### 7. Tax in Advance

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Payment of CP500	4,105,545	4,341,376
Current Year Tax	(3,647,676)	(3,107,083)
	457,869	1,234,293
Advance Tax Balance from Previous Year	1,234,293	-
<b>TOTAL</b>	<b>1,692,162</b>	<b>1,234,293</b>

**Notes on the Financial Statements...continued**

**8. Property, Fittings and Equipment**

**2022**

	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
<b>Cost</b>								
At 1 January	8,299,405	79,205,160	4,144,439	7,232,401	5,335,731	5,552,560	1,585,140	111,354,836
Addition	-	-	405,492	157,835	255,158	661,560	-	1,480,045
Disposal/Transfer	-	-	-	-	-	(21,120)	-	(21,120)
At 31 December	8,299,405	79,205,160	4,549,931	7,390,236	5,590,889	6,193,000	1,585,140	112,813,761
<b>Accumulated Depreciation</b>								
At 1 January	-	13,464,876	3,565,494	6,419,110	4,822,964	4,871,067	1,551,709	34,695,220
Current Year Depreciation	-	1,584,103	214,624	312,342	172,678	466,932	11,000	2,761,679
Disposal/Transfer	-	-	-	-	-	(21,116)	-	(21,116)
At 31 December	-	15,048,979	3,780,118	6,731,452	4,995,642	5,316,883	1,562,709	37,435,783
<b>Net Book Value</b>								
At 31 December	<b>8,299,405</b>	<b>64,156,181</b>	<b>769,813</b>	<b>658,784</b>	<b>595,247</b>	<b>876,117</b>	<b>22,431</b>	<b>75,377,978</b>

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## Notes on the Financial Statements...continued

### 8. Property, Fittings and Equipment...continued

2021

	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
<b>Cost</b>								
At 1 January	8,299,405	79,205,160	4,144,439	7,052,286	5,358,021	5,167,648	1,580,140	110,807,099
Addition	-	-	-	180,115	173,590	389,911	5,000	748,616
Disposal/Transfer	-	-	-	-	(195,880)	(4,999)	-	(200,879)
At 31 December	8,299,405	79,205,160	4,144,439	7,232,401	5,335,731	5,552,560	1,585,140	111,354,836
<b>Accumulated Depreciation</b>								
At 1 January	-	11,880,773	3,342,073	6,024,966	4,837,381	4,344,647	1,541,625	31,971,465
Current Year Depreciation	-	1,584,103	223,421	394,144	181,454	531,418	10,084	2,924,624
Disposal/Transfer	-	-	-	-	(195,871)	(4,998)	-	(200,869)
At 31 December	-	13,464,876	3,565,494	6,419,110	4,822,964	4,871,067	1,551,709	34,695,220
<b>Net Book Value</b>								
At 31 December	8,299,405	65,740,284	578,945	813,291	512,767	681,493	33,431	76,659,616



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	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Payables	9,765	294,736
Accrued Payables	15,270,182	14,593,906
Compounds for Consolidated Fund under NRECC	27,000	-
Audit Fees	50,562	50,562
<b>TOTAL</b>	<b>15,357,509</b>	<b>14,939,204</b>

Payables and Accrued Payables are interest free and settlements made normally within 30-days term.

**10. Provision for Employee Benefits**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
At 1 January	20,151,072	19,227,195
Current Year Provision	7,421,440	3,811,684
Current Year Payments	(4,162,358)	(2,887,807)
At 31 December	<b>23,410,154</b>	<b>20,151,072</b>

The maturity structure for Provisions for Employees Benefits are as follows:

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Maturity within 12 months	3,282,678	4,024,349
Maturity exceeding 12 months	20,127,476	16,126,723
<b>TOTAL</b>	<b>23,410,154</b>	<b>20,151,072</b>

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### Notes on the Financial Statements...continued

#### 10. Provision for Employee Benefits...continued

The Actuarial assumption used to calculate the Provision for Employee Benefits for Gratuity is the average of annual salary increment rate of 5.0% (2021: 7.5%) and the average discount rate of 4.29% (2021: 4.17%) while the calculation for Provisions for Staff Leave is using the average annual salary increment rate of 5.0% and the average discount rate of 4.26%.

#### 11. Special Funds

##### 2022

	PPKTL Special Funds Account	MyPower Special Funds Account	PR&PLL Special Funds Account	MEIH and MyEnergy Stats Special Funds Account	Total
	RM	RM	RM	RM	RM
Balance as at 1 January 2022	158,547	1,968	5,545,704	-	5,706,219
Income:					
Government/Agency Contribution	-	-	-	153,000	153,000
Bank Interest	1,603	3	51,724	19	53,349
	1,603	3	51,724	153,019	206,349
(-) Expenditure:					
Bank Charges	-	(10)	-	-	(10)
Expenses/Repayment for The Year	(94,400)	-	(3,491,476)	-	(3,585,876)
	(94,400)	(10)	(3,491,476)	-	(3,585,886)
(Deficit)/Surplus	(92,797)	(7)	(3,439,752)	153,019	(3,379,537)
<b>Balance as at 31 December 2022</b>	<b>65,750</b>	<b>1,961</b>	<b>2,105,952</b>	<b>153,019</b>	<b>2,326,682</b>

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	<b>PPKTL Special Funds Account RM</b>	<b>MyPower Special Funds Account RM</b>	<b>PR&amp;PLL Special Funds Account RM</b>	<b>Total RM</b>
Balance as at 1 January 2021	<b>156,960</b>	<b>1,975</b>	<b>5,588,544</b>	<b>5,747,479</b>
Income:				
Bank Interest	1,587	3	55,822	<b>57 412</b>
	1,587	3	55,822	<b>57 412</b>
(-) Expenditure:				
Bank Charges	-	(10)	(2)	<b>(12)</b>
Expenses/Repayment for The Year	-	-	(98,660)	<b>(98,660)</b>
	-	(10)	(98,662)	<b>(98,672)</b>
Surplus/(Deficit)	1,587	(7)	(42,840)	<b>(41,260)</b>
<b>Balance as at 31 December 2021</b>	<b>158,547</b>	<b>1,968</b>	<b>5,545,704</b>	<b>5,706,219</b>

Special Funds are special allocations received from the Electricity Supply Industries Trust Fund (AAIBE) under the Ministry of Energy, Green Technology and Water (KeTTHA), which is currently administered by the Ministry of Natural Resources, Environment and Climate Change (NRECC) 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. An amount of RM94,400 has been utilised in 2022 for Energy Efficiency and Conservation Week (EECW).
- (ii). **MyPower Special Funds Account:** to finance the implementation of project initiatives under the 10th Malaysia Plan namely the Stabilization 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. In the year 2022, an amount of RM3,491,476 has been transferred to Sustainable Energy Development Authority (SEDA) for the implementation of Energy Efficiency Retrofit project as approved by the Ministry of Energy and Natural Resources (currently known as Ministry of Natural Resources, Environment and Climate Change).

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### Notes on the Financial Statements...continued

#### 11. Special Funds...continued

- (iv). **MEIH and MyEnergyStats Special Funds Account:** allocation was obtained from AAIBE to fund the enhancement project of the Malaysia Energy Hub (MEIH) portal and the MyEnergyStats Mobile Application which starts on 1 October 2022.

#### 12. Fees and Charges

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Public and Private Licenses	95,353,682	80,184,691
Registration/Operations Renewal Fees	34,913,740	31,858,360
Other Operating Fees	1,085,471	702,116
<b>TOTAL</b>	<b>131,352,893</b>	<b>112,745,167</b>

#### 13. Wages, Allowances and Employee Benefits

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Wages and Allowances	40,714,348	38,999,966
Energy Commission Members' Allowances	663,224	801,438
Statutory Contributions	8,240,223	8,842,554
Other Financial Benefits	20,531,387	14,768,532
<b>TOTAL</b>	<b>70,149,182</b>	<b>63,412,490</b>

The total number of Energy Commission's employees as at 31 December 2022 stands at 369 personnel. Meanwhile, the total number of employees in 2021 was 372 personnel. The number of Energy Commission members for the year 2022 is 9 personnel while in 2021 was 10 personnel. Included in the Statutory Contributions is the contribution made to the Employees Provident Fund (EPF) amounting to RM7,921,614 (2021: RM8,530,565), contributions to Social Security Organization (SOCSO) amounting RM313,119 (2021: RM293,918) and *Kumpulan Wang Persaraan (Diperbadankan)* (KWAP) amounting to RM5,490 (2021: RM18,071).

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	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Application System Maintenance	4,788,758	4,095,203
Equipment, Vehicle and Office Building Maintenance	2,382,354	2,015,130
<b>TOTAL</b>	<b>7,171,112</b>	<b>6,110,333</b>

**15. Professional Services**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Audit Fees	50,562	50,562
Professional and Consultancy Fees	7,270,388	8,778,550
Development Cost of Competency and Management Performance	705,415	1,035,863
Other Professional Services Expenses	1,599,178	566,462
<b>TOTAL</b>	<b>9,625,543</b>	<b>10,431,437</b>

**16. Other Expenses**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Federal Consolidated Fund	5,250,000	-
Touch point	305,213	211,013
Corporate Social Responsibility	246,980	511,951
Energy Efficiency Challenge	137,395	108,750
<b>TOTAL</b>	<b>5,939,588</b>	<b>831,714</b>

Other Expenses inclusive of contributions or sponsorships made by the Energy Commission.



## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)

### Notes on the Financial Statements...continued

#### 17. Taxation Expense

	2022 RM	2021 RM
<b>Tax Expenses</b>		
Current Year	<u>3,647,676</u>	<u>3,107,083</u>
<b>Reconciliation of Effective Tax Rate</b>		
Surplus Income Before Tax	38,589,462	32,930,117
Tax at 30%	11,576,839	9,879,035
Tax-Exempted Income	<u>(7,929,163)</u>	<u>(6,771,952)</u>
<b>Tax Expense</b>	<u><b>3,647,676</b></u>	<u><b>3,107,083</b></u>

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 Government 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.

**ENERGY COMMISSION**Established under the Energy Commission Act 2001 (Act 610) and  
Energy Commission (Amendment) Act 2010 (Act A1371)**Notes on the Financial Statements...continued****18. Comparative Information**

	Before RM	Reclassification RM	After RM
<b><u>Impact on the Statement of Financial Position for the year ending 31 December 2021</u></b>			
<u>Current Liabilities</u>			
Other Payables and Accrued Expenses	17,734,463	(2,795,259)	14,939,204
Provision for Short Term Employee Benefits	3,735,555	288,794	4,024,349
<u>Non-Current Liabilities</u>			
Provision for Long Term Employee Benefits	13,620,258	2,506,465	16,126,723
<b><u>Impact on the Statement of Cash Flow for the year ended 31 December 2021</u></b>			
Provisions for Employee Benefits	3,103,377	708,307	3,811,684
Increase in Other Payables and Accrued Liabilities	2,227,026	(649,990)	1,577,036
Payment for Employee Benefits	(2,829,490)	(58,317)	(2,887,807)

Reclassification from Other Payables to Provision for Short Term Employee Benefits and Provision for Long Term Employee Benefits is for the Provisions for Staff Leave based on Actuarial Valuation Method.

## ENERGY COMMISSION

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### Notes on the Financial Statements...continued

#### 19. Budget Information

The Energy Commission's budget is approved by the Ministry of Natural Resources, Environment and Climate Change (NRECC), encompassing fiscal period of 1 January 2022 to 31 December 2022.

The following are the material differences between the the amount of Final Budget and Actual for the year 2022:

Details	Actual 2022	Final Budget 2022	Difference between Final Budget and Actual
	RM	RM	RM
<b><u>INCOME</u></b>			
Income from Operation	131,352,893	117,191,852	14,161,041
Interests Income, Profits from <i>Hibah</i> and Other Income	12,547,876	9,524,000	3,023,876
<b><u>EXPENSES</u></b>			
Emolument	70,092,812	71,928,000	1,835,188
Office Supplies	729,275	1,843,200	1,113,925
Maintenance	5,151,426	8,185,263	3,033,837
Professional Services	10,298,167	20,828,512	10,530,345
Other Expenses	5,919,608	12,085,000	6,165,392
Assets	906,639	1,950,000	1,043,361

Revenue collection from Electricity and Gas Public Licensing has contributed to the increase in actual Income from Operation for the year 2022 compared to the final budget while the increase in Interest Income for the year 2022 is different compared to the Final Budget 2022 due to increase in fixed deposit *hibah* rate in line with the increase in Overnight Policy Rate (OPR).

The differences between the Final Budget and the Initial Budget of 2022 is after taking into account budget transfers processes allowed by the *Had Kuasa Kewangan* and *Manual Prosedur Kewangan Suruhanjaya Tenaga (Pindaan 2017)*. Budget transfers are made based on the needs of the Energy Commission's activities and operations expenses for Office Supplies, Maintenance, Professional Services, Emolument and Assets. However, the amount of the budget transfer by expenses does not exceed the total amount of the budget that has been approved for the year 2022.

**ENERGY COMMISSION**

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**Notes on the Financial Statements...continued****19. Budget Information...continued**

The differences between final budget and actual expenses for Emolument is the budget surplus for meeting allowances and staff overtime allowances as such expenses were made where it is required, while a portion of final budget balance for related Purchase Orders for Office Supplies are recorded in Commitments.

The differences between actual expenses for 2022 and the final budget for 2022 for Maintenance and Professional Services is due to building maintenances and application system works, also for development projects which is currently executed according to progress while remaining works that has not been completed which is recorded as Commitments.

The differences between actual expenses and final budget for Other Expenses is due to additional budget for Federal Consolidated Fund (KWDP) as approved by NRECC, while the balance of the Final Budget includes expenses for contributions to KWDP in 2022 and Touch Point contributions which amounting to RM5,370,000 and recorded as Commitments.

Expenses on Assets are based on requirement and a component of Final Budget balances regarding procurement of assets which is currently in progress was recorded as Commitment.

**20. Commitments**

	<b>2022</b>	<b>2021</b>
	<b>RM</b>	<b>RM</b>
Property, Fittings and Equipment	790,706	582,086
Professional Services	15,589,571	12,643,280
Office Supplies and Maintenance	1,696,318	2,689,532
Other expenses - Contributions	5,370,000	19,980
Emolument	-	56,370
<b>TOTAL</b>	<b>23,446,595</b>	<b>15,991,248</b>

## ENERGY COMMISSION

Established under the Energy Commission Act 2001 (Act 610) and  
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### Notes on the Financial Statements...continued

#### 20. Commitments...continued

Included in the Commitments for the year ended 31 December 2022 under Property, Fittings and Equipment amounting to RM790,706 are procurement of 2 vehicles, fittings and electronic equipment. Professional Services consists of services for projects under ST's research and development amounting RM14,421,639 and other professional and consultancy services amounting RM1,167,932.

Commitments for Maintenance for the year ended 31 December 2022 is related to ICT maintenance activities and system support services as well as building maintenance amounting to RM1,307,630, and the cost of Office Supplies amounting to RM388,688. In addition, there is also a Commitment for the Contribution of the Federal Consolidated Fund (KWDP) and Touch Point amounting to RM5,370,000.

Commitments costs for the year 2021 amounting to RM15,991,248 consists of costs related to Property, Fittings and Equipment, Professional Services, Utilities, Maintenance and Office Supplies, Contributions and Emolument.

#### 21. Contingent Liability

(I). Solaris Dutamas Management Corporation

An Originating Summons was filed in the Kuala Lumpur High Court against the Energy Commission (ST) and Gas Malaysia Berhad (GMB) by the Solaris Dutamas Management Corporation (Solaris) on 12 December 2019 alleging ST's actions imposing obligation on Solaris to apply for gas retail license under the Gas Supply Act 1993 [Act 501] to supply natural gas to the development area and maintain consumer pipelines is ultra vires the Strata Management Act 2013. On 27 August 2020, the High Court dismissed the Originating Summons filed by Solaris with costs. Solaris appealed to the Court of Appeal and the Court of Appeal on 1 October 2021 allowed Solaris' appeal. This case was heard in the Federal Court and on 6 December 2022, ST and GMB's appeal was rejected by the Court.

(II). Strong Elegance Sdn Bhd

On 18 December 2020, a civil action was filed in the Kuala Lumpur High Court against ST by Strong Elegance Sdn Bhd (SE) for a declaration that the withdrawal of the Letter of Award for the Large Scale Solar project dated 2 May 2017 by ST was invalid and demanded damages for all costs and expenses incurred by SE as a result of the withdrawal of the Award Letter including general damages and exemplary damages to be assessed by the Court. On 15 March 2023, the High Court Judge decided that a declaration be given that the withdrawal of the Letter of



## ENERGY COMMISSION

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### Notes on the Financial Statements...continued

#### 21. Contingent Liability...continued

(II). Strong Elegance Sdn Bhd...continued

Award is illegal, null and void and a breach of contract. The Judge fixed a date for assessment of damages on 17 and 20 July 2023.

ST has filed a Notice of Motion to the Court of Appeal for a stay of proceeding on 31 May 2023 and filed an appeal to the Court of Appeal. The Court of Appeal fixed 3 July 2023 for the Case Management on stay of proceeding and 27 June 2023 for the case management on the appeal case.

# Glosari

## Glossary

Istilah Term	Definisi	Definition
<b>AA</b>	Aturan Akses  Dokumen yang dibangunkan oleh pemilik/pengendali kemudahan-kemudahan gas, yang mengandungi terma-terma dan syarat-syarat untuk memperoleh akses kepada kemudahan-kemudahan gas.	<i>Access Arrangement</i>  <i>A document developed by the owner/operator of the gas facilities, which contains the terms and conditions for gaining access to the gas facilities.</i>
<b>AFOC</b>	<i>ASEAN Forum On Coal</i>  Forum yang ditubuhkan untuk mempromosikan kerjasama ASEAN dan meneroka peluang perniagaan yang berkaitan dengan arang batu.	<i>ASEAN Forum On Coal</i>  <i>A forum established to promote ASEAN cooperation and explore business opportunities related to coal.</i>
<b>ARA</b>	Pelarasan Hasil Tahunan  Semakan semula purata tarif yang dibenarkan sekiranya terdapat perbezaan di antara pendapatan yang dibenarkan dan pendapatan sebenar.	<i>Annual Revenue Adjustment</i>  <i>A review of the allowed average tariff if there is a difference between the allowed revenue and the actual revenue.</i>
<b>ATI</b>	Kelulusan untuk Memasang  Kelulusan yang perlu diperolehi daripada ST sebelum mana-mana pihak memulakan kerja pada pemasangan gas baharu atau tambahan.	<i>Approval to Operate</i>  <i>Approval to be obtained from the Commission ST before any party begins operating new gas installation.</i>
<b>ATO</b>	Kelulusan untuk Mengendali  Kelulusan yang perlu diperolehi daripada ST sebelum mana-mana pihak boleh mengendalikan sesuatu pemasangan gas yang baharu.	<i>Approval to Operate</i>  <i>Approval to be obtained from the Commission ST before any party begins operating new gas installation.</i>
<b>BEI</b>	Indeks Tenaga Bangunan  Penanda aras dalam memantau prestasi tenaga bangunan dengan menunjukkan intensiti tenaga yang digunakan bagi setiap meter persegi luas bangunan	<i>Building Energy Index</i>  <i>A benchmarking tool in monitoring building energy performance by indicating the intensity of energy used per meter square area of the building</i>
<b>BESS</b>	<i>Battery Energy Storage System</i>  Teknologi yang membolehkan penyimpanan tenaga daripada sumber tenaga boleh baharu (TBB) seperti solar dan angin, dan kemudian digunakan mengikut keperluan.	<i>Battery Energy Storage System</i>  <i>A technology that enables energy from renewables such as solar and wind, to be stored and then released as needed.</i>
<b>CAIDI</b>	<i>Customer Average Interruption Duration Index</i>  Kadar purata tempoh masa gangguan bekalan dialami oleh pelanggan yang terlibat dalam setahun.	<i>Customer Average Interruption Duration Index</i>  <i>The average duration of supply interruption experienced by affected customers during the year.</i>
<b>CAPEX</b>	Perbelanjaan Modal  Perbelanjaan yang digunakan untuk membeli, menyelenggara atau mengembangkan aset tetap.	<i>Capital Expenditures</i>  <i>Expenses used to purchase, maintain, or expand fixed assets.</i>
<b>CCGT</b>	Turbin Gas Kitar Padu  Loji jana kuasa elektrik yang menggabungkan penggunaan turbin gas dan turbin stim untuk mencapai tahap kecekapan yang lebih tinggi.	<i>Combined Cycle Gas Turbine</i>  <i>Electrical power plant in which a gas turbine and a steam turbine are used in combination to achieve greater efficiency.</i>
<b>CGPP</b>	<i>Corporate Green Power Programme</i>  Inisiatif oleh Kerajaan untuk memberi peluang kepada entiti perniagaan untuk menggunakan tenaga boleh baharu dalam operasi perniagaan mereka.	<i>Corporate Green Power Programme</i>  <i>An initiative by the Government to provide opportunity for business entities to use renewable energy in their business operation.</i>
<b>COA</b>	Perakuan Kelulusan  Perakuan yang dikeluarkan sebagai kelulusan untuk mengilang, mengimport, mempamer, menjual dan mengiklan kelengkapan elektrik seperti yang dinyatakan di bawah Peraturan 97(1) Peraturan-Peraturan Elektrik 1994.	<i>Certificate of Approval</i>  <i>A certificate issued as an approval to manufacture, import, exhibit, sell and advertise any electrical equipment prescribed under sub regulation 97(1) of the Electricity Regulations 1994.</i>
<b>DePUI</b>	<i>Delivery Point Unreliability Index</i>  Indeks daya harap pemindahan kuasa elektrik daripada sistem penghantaran kepada sistem pengagihan.	<i>Delivery Point Unreliability Index</i>  <i>Index of the reliability of power transfer from the transmission system to the distribution system.</i>


<b>DFC</b>	<i>Demand Forecasting Committee</i>  Jawatankuasa bagi pengumpulan input daripada pihak-pihak berkepentingan dan berkepakaran berhubung unjuran pertumbuhan ekonomi dan permintaan elektrik.	<i>Demand Forecasting Committee</i>  <i>A committee that collects inputs from stakeholders and experts regarding economic growth and electricity demand forecasts.</i>
<b>EACG</b>	Geran Audit Tenaga Bersyarat  Geran yang diperuntukkan bagi sektor komersial dan industri untuk bekerjasama dengan syarikat perkhidmatan tenaga yang berdaftar dengan ST untuk melaksanakan audit tenaga.	<i>Energy Audit Conditional Grant</i>  <i>A grant allocated for commercial and industrial sectors to collaborate with local energy service companies (ESCOs) registered with the Commission to conduct energy audit.</i>
<b>EE</b>	Kecekapan Tenaga  Penggunaan tenaga elektrik yang optimum untuk menyempurnakan kerja yang sama tanpa mengganggu keselesaan pengguna.	<i>Energy Efficiency</i>  <i>Optimum use of electricity to complete the same work without compromising the comfort of the user.</i>
<b>EIF</b>	Kumpulan Wang Industri Elektrik  Kumpulan wang yang ditubuhkan bagi menguruskan impak tarif elektrik terhadap pengguna atau apa-apa maksud lain yang berkaitan dengan industri elektrik sebagaimana yang disifatkan perlu oleh ST.	<i>Energy Industry Fund</i>  <i>A fund established to manage the impact of electricity tariffs on consumers or any other purposes related to the electricity industry as deemed necessary by the Commission.</i>
<b>EMEER 2008</b>	Peraturan Pengurusan Tenaga Elektrik Dengan Cepak 2008  Peraturan yang digubal pada 15 Disember 2008 untuk menambah baik amalan pengurusan tenaga di kalangan pengguna tenaga yang besar.	<i>Efficient Management of Electrical Energy Regulation 2008</i>  <i>Regulation enacted on 15 December 2008 to improve energy management practices among large energy consumers.</i>
<b>FIT</b>	<i>Feed-in Tariff</i>  Mekanisme yang membenarkan tenaga elektrik yang dijana daripada sumber tenaga boleh baharu (TBB) oleh penjana bebas dan individu dijual kepada syarikat utiliti bekalan elektrik (TNB) pada kadar tarif premium untuk satu tempoh yang telah ditetapkan oleh Kerajaan.	<i>Feed-in Tariff</i>  <i>A mechanism that allows electricity generated from renewable energy sources by independent power producers and individuals sold to the electricity supply utility (TNB) at a premium rate for a period set by the Government.</i>
<b>GCPT</b>	Pelepasan Kos Gas  Mekanisme yang membolehkan semakan tarif gas bagi mencerminkan perbezaan antara kos unjuran dan kos sebenar yang berada di luar kawalan pihak utiliti.	<i>Gas Cost Pass-Through</i>  <i>A mechanism that allows tariff revisions to reflect the difference between the forecasted and actual gas cost which is beyond the control of utility.</i>
<b>GET</b>	Tarif Elektrik Hijau  Program yang menawarkan pilihan kepada pengguna untuk membeli bekalan elektrik rendah karbon, bagi membolehkan pengguna mengurangkan jejak karbon mereka dalam penggunaan elektrik.	<i>Green Electricity Tariff</i>  <i>A programme that offers the consumers the option to purchase low carbon electricity supply, to enable the consumers to reduce their carbon footprint in electricity consumption.</i>
<b>GSL</b>	Tahap Perkhidmatan Yang Dijamin  Perkhidmatan-perkhidmatan yang dijamin oleh pihak utiliti di mana kegagalan mematuhi akan menyebabkan pihak utiliti dikehendaki membayar penalti dalam bentuk rebat kepada pengguna.	<i>Guaranteed Service Level</i>  <i>Services guaranteed by the utility where failure to comply will result in the utility required to pay penalties in a form of rebate to the consumers.</i>
<b>GSO</b>	Pengendali Sistem Grid  Badan yang bertanggungjawab untuk operasi masa nyata harian dan pengurusan sistem grid di Semenanjung, serta perancangan jangka pendek dan sederhana untuk rangkaian penghantaran dan kemudahan penjanaan.	<i>Grid System Operator</i>  <i>An organisation responsible for the day-to-day real-time operation and the management of the Peninsula grid system, together with the short and medium term planning of the transmission network and generation facilities.</i>
<b>GWh</b>	Gigawatt jam  Satu unit tenaga yang mewakili satu bilion watt jam dan bersamaan dengan satu juta kilowatt jam, sering digunakan sebagai ukuran keluaran stesen janakuasa elektrik yang besar.	<i>Gigawatt hour</i>  <i>A unit of energy representing one billion watt hours and is equivalent to one million kilowatt hours, often used as a measure of the output of large electricity power stations.</i>
<b>IBR</b>	Kawal Selia Berasaskan Insentif  Rangka kerja bagi penetapan tarif yang berstruktur dan telus untuk industri tenaga, yang memastikan utiliti terus meningkatkan kecekapan dan ketelusan dalam membekalkan tenaga dengan pematuhan unjuran perbelanjaan sepenuhnya.	<i>Incentive-Based Regulation</i>  <i>A structured and transparent tariff setting framework for the energy industry that ensures the utilities to continuously enhance their efficiencies and increase transparency in supplying energy in full compliance of the projected expenditures.</i>
<b>ICPT</b>	Pelepasan Kos Tidak Berimbang  Mekanisme di bawah rangka kerja IBR yang membolehkan semakan semula tarif elektrik setiap enam (6) bulan bagi mencerminkan perubahan harga bahan api dan kos penjanaan yang lain, yang berada di luar kawalan pihak utiliti.	<i>Imbalanced Cost Pass-Through</i>  <i>A mechanism under the IBR framework that allows electricity tariff revisions every six (6) months to reflect changes in fuel and other generation-related costs, which is beyond the control of the utility.</i>

<b>IEPRE</b>	<i>Institute of Energy Policy and Research</i>  Sebuah institut penyelidikan di bawah Universiti Tenaga Nasional (UNITEN) yang memfokuskan kepada isu berkaitan tenaga dan alam sekitar.	<i>Institute of Energy Policy and Research</i>  <i>A research institute under Universiti Tenaga Nasional (UNITEN) which focus on the issue related to energy and environment.</i>
<b>IPP</b>	Penjana Bebas  Entiti yang bukan merupakan pihak utiliti namun memiliki dan mengendalikan stesen jana kuasa untuk menjana elektrik untuk dijual kepada pihak utiliti dan pengguna akhir.	<i>Independent Power Producer</i>  <i>An entity that is not a public utility but develops and operates power plants to generate electricity for sale to utilities and end users.</i>
<b>JPPPET</b>	Jawatankuasa Perancangan dan Pelaksanaan Pembekalan Elektrik dan Tarif  Sebuah jawatankuasa yang bertujuan untuk merancang, menyelaraskan dan mengenal pasti keperluan bekalan elektrik bagi memenuhi permintaan elektrik di Semenanjung melalui mesyuarat tahunan.	<i>Planning and Implementation Committee of Electricity Supply and Tariff</i>  <i>A committee that aims to plan, coordinate and identify electricity supply requirements to meet electricity demand in the Peninsula through an annual meeting.</i>
<b>kWh</b>	Kilowatt jam  Unit pengebilan biasa untuk tenaga elektrik yang dibekalkan oleh pihak utiliti, yang bersamaan dengan satu kilowatt yang dipindahkan dalam satu jam.	<i>Kilowatt hour</i>  <i>A common billing unit for electrical energy supplied by electric utilities, which equals to one kilowatt sustained for one hour.</i>
<b>KWIE</b>	Kumpulan Wang Industri Elektrik  Kumpulan wang yang ditubuhkan bagi menguruskan impak tarif elektrik terhadap pengguna atau apa-apa maksud lain yang berkaitan dengan industri elektrik sebagaimana yang disifatkan perlu oleh ST.	<i>Energy Industry Fund</i>  <i>A fund established to manage the impact of electricity tariffs on consumers or any other purposes related to the electricity industry as deemed necessary by the Commission.</i>
<b>LNG</b>	Gas Asli Cecair  Gas asli dalam bentuk cecair yang menjadikannya selamat, mudah dan menjimatkan kos untuk diangkut dan disimpan. LNG tidak berwarna, tidak berbau, tidak toksik serta tidak menghakis.	<i>Liquefied Natural Gas</i>  <i>Natural gas in liquid form which makes it safe, easy and cost effective to transport and store. LNG is colourless, odourless, non-toxic and non-corrosive.</i>
<b>LPG</b>	Gas Petroleum Cecair  Gas petroleum dalam bentuk cecair yang sangat mudah terbakar, dengan kegunaan utama termasuk menghidupkan peralatan pemanas dan peralatan memasak.	<i>Liquefied Petroleum Gas</i>  <i>Liquefied form of petroleum gas that is highly flammable, with primary usages include powering heating appliances and cooking equipment.</i>
<b>LSS</b>	Ladang Solar Berskala Besar  Program bidaan kompetitif yang membolehkan penjanaan elektrik melalui ladang solar fotovoltaik untuk dijual kepada grid.	<i>Large Scale Solar</i>  <i>A competitive bidding programme that allows electricity generation via solar photovoltaic farm to be sold to the grid.</i>
<b>MEPS</b>	Standard Prestasi Tenaga Minimum  Penarafan kecekapan tenaga yang perlu dipenuhi oleh peralatan elektrik tertentu sebelum dijual kepada pengguna.	<i>Minimum Energy Performance Standards</i>  <i>Energy efficiency rating that needs to be met by certain electrical appliances before being sold to the consumers.</i>
<b>MMBtu</b>	<i>Metric Million British Thermal Unit</i>  Unit yang digunakan secara tradisional untuk mengukur kandungan haba atau nilai tenaga. Ia dikaitkan secara meluas dengan pengukuran gas asli dalam istilah tenaga secara global.	<i>Metric Million British Thermal Unit</i>  <i>A unit traditionally used to measure heat content or energy value. It is widely associated with measurement of natural gas in the energy terms globally.</i>
<b>mmscfd</b>	<i>Million Standard Cubic Feet per Day</i>  Kadar aliran gas.	<i>Million Standard Cubic Feet per Day</i>  <i>The flow rate of gas.</i>
<b>MSL</b>	Tahap Perkhidmatan Minimum  Tahap prestasi minimum yang ditetapkan bagi mengukur kecekapan utiliti dalam memberikan perkhidmatan kepada pengguna.	<i>Minimum Service Level</i>  <i>The minimum performance level set to measure the efficiency of the utility in providing service to the consumers.</i>
<b>MWh</b>	Megawatt jam  Ukuran penjanaan elektrik 1 MW yang dihasilkan dalam tempoh satu jam.	<i>Megawatt hour</i>  <i>A measure of electricity generation of 1 MW produced over one hour.</i>
<b>NEDA</b>	<i>New Enhanced Dispatch Arrangement</i>  Program yang diwujudkan untuk meningkatkan kecekapan kos pasaran Pembeli Tunggal melalui persaingan jangka pendek (harian).	<i>New Enhanced Dispatch Arrangement</i>  <i>A programme designed to enhance cost efficiency of the Single Buyer market through short run (daily) competition.</i>
<b>NEEAP</b>	Pelan Tindakan Kecekapan Tenaga Nasional  Pelan yang menumpukan untuk menangani isu-isu yang berkaitan bekalan tenaga dengan menguruskan permintaan dengan cekap.	<i>National Energy Efficiency Action Plan</i>  <i>A plan focused to tackle issues pertaining to energy supply by managing demand efficiently.</i>

<b>NEM</b>	<p>Pemeteran Tenaga Bersih</p> <p>Mekanisme di mana pengguna yang layak memasang sistem solar fotovoltaik terutamanya untuk kegunaannya sendiri, manakala lebih tenaga untuk dieksport ke grid dan diimbangi dengan tenaga yang disediakan oleh utiliti.</p>	<p><i>Net Energy Metering</i></p> <p><i>A mechanism where an eligible consumer installs a solar photovoltaic system primarily for his own use while the excess of energy to be exported to the grid and to be offset against the energy provided by the utility.</i></p>
<b>OCGT</b>	<p>Turbin Gas Kitar Terbuka</p> <p>Loji janakuasa turbin gas untuk penjanaan elektrik yang beroperasi dalam konfigurasi kitaran terbuka, di mana gas buangan daripada turbin gas dilepaskan terus ke atmosfera selepas ia melalui turbin.</p>	<p><i>Open Cycle Gas Turbine</i></p> <p><i>Gas turbine power plant for electricity generation operating in an open cycle configuration, where the exhaust gases from the gas turbine are released directly into the atmosphere after they pass through the turbine.</i></p>
<b>PPA</b>	<p>Perjanjian Jual Beli Tenaga</p> <p>Perjanjian kontrak antara dua pihak, biasanya penjana kuasa (penjual) dan pembeli elektrik (pembeli) yang merangkumi terma dan syarat di mana elektrik akan dijual dalam tempoh masa tertentu.</p>	<p><i>Power Purchase Agreement</i></p> <p><i>A contractual agreement between two parties, typically a power generator (seller) and an electricity purchaser (buyer) which includes the terms and conditions under which electricity will be sold over a specified period of time.</i></p>
<b>PTH</b>	<p>Pulau Tenaga Hijau</p> <p>Inisiatif perintis pembangunan Pulau Redang, Pulau Perhentian dan Pulau Tioman bagi menyediakan bekalan elektrik yang konsisten, mampu bayar dan rendah pelepasan karbon.</p>	<p><i>Green Energy Island</i></p> <p><i>Pioneer initiative for the development of Redang Island, Perhentian Island, and Tioman Island to provide consistent, affordable, and low-carbon electricity supply.</i></p>
<b>RGT</b>	<p>Terminal Regasifikasi</p> <p>Fasiliti yang digunakan untuk menukar semula LNG kepada keadaan gas asalnya untuk pengedaran dan penggunaan.</p>	<p><i>Regasification Terminal</i></p> <p><i>A facility used to convert LNG back into its gaseous state for distribution and consumption.</i></p>
<b>SAIDI</b>	<p><i>System Average Interruption Duration Index</i></p> <p>Purata gangguan elektrik dalam minit yang dialami oleh pelanggan dalam setahun.</p>	<p><i>System Average Interruption Duration Index</i></p> <p><i>Average electricity interruptions in minutes experience by customers in a year.</i></p>
<b>SAIFI</b>	<p><i>System Average Interruption Frequency Index</i></p> <p>Purata kekerapan gangguan bekalan dalam setahun.</p>	<p><i>System Average Interruption Frequency Index</i></p> <p><i>Average frequency of supply interruption per year.</i></p>
<b>SARFI</b>	<p><i>System Average RMS Frequency Index</i></p> <p>Penanda aras antarabangsa bagi penilaian kualiti kuasa yang digunakan untuk merekod bilangan kejadian junaman voltan di bawah paras yang telah ditetapkan.</p>	<p><i>System Average RMS Frequency Index</i></p> <p><i>The international benchmark to measure power quality, used to record the number of voltage sags that occur below a specified threshold.</i></p>
<b>SB</b>	<p>Pembeli Tunggal</p> <p>Sebuah entiti yang diasingkan yang diamanahkan untuk menguruskan perancangan dan perolehan tenaga elektrik di Semenanjung.</p>	<p><i>Single Buyer</i></p> <p><i>A ring-fenced entity entrusted to manage planning and procurement of electricity in the Peninsula.</i></p>
<b>TBB</b>	<p>Tenaga Boleh Baharu</p> <p>Tenaga yang didapati daripada sumber boleh diperbaharui dan tidak akan habis seperti solar dan angin.</p>	<p><i>Renewable Energy</i></p> <p><i>Energy collected from renewable and undepletable sources such as solar and wind.</i></p>
<b>TPA</b>	<p>Akses Pihak Ketiga</p> <p>Sistem yang membolehkan pelbagai entiti mendapat akses dan menggunakan kemudahan gas yang terdapat di Malaysia pada terma dan syarat yang sama.</p>	<p><i>Third Party Access</i></p> <p><i>A system that allows multiple entities to have access to and utilise the gas facilities available in Malaysia on the same terms and conditions.</i></p>
<b>UFLS</b>	<p>Lucutan Beban</p> <p>Langkah perlindungan yang digunakan dalam sistem kuasa untuk mengelakkan kejadian putus bekalan yang meluas atau ketidakstabilan sistem semasa situasi kecemasan, seperti kehilangan penjanaan tenaga secara tiba-tiba atau ketidakseimbangan besar antara bekalan dan permintaan elektrik.</p>	<p><i>Under-Frequency Load Shedding</i></p> <p><i>A protective measure used in power systems to prevent widespread blackouts or system instability during emergency situations, such as sudden loss of generation or a large imbalance between electricity supply and demand.</i></p>
<b>VAWT</b>	<p>Turbin Angin Paksi Menegak</p> <p>Sejenis turbin angin di mana aci pemutar utama ditetapkan melintang kepada angin manakala komponen utama terletak di dasar turbin.</p>	<p><i>Verticle Axis Wind Turbine</i></p> <p><i>A type of wind turbine where the main rotor shaft is set transverse to the wind while the main components are located at the base of the turbine.</i></p>
<b>WASL</b>	<p><i>Wide Area System Loss</i></p> <p>Kehilangan kuasa elektrik di kawasan geografi yang luas dalam suatu sistem tenaga yang saling berhubung.</p>	<p><i>Wide Area System Loss</i></p> <p><i>Loss of electrical power over a large geographic area within an interconnected power system.</i></p>



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