APPENDIX B

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35TH ANNUAL GENERAL MEETING TENAGA NASIONAL BERHAD

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22 MAY 2025

LEADING THE ENERGY TRANSITION FOR A SUSTAINABLE TOMORROW

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MINORITY SHAREHOLDER WATCH GROUP (MSWG) RESPONSES

Operational and Financial Matters (1/2)



- 1. In 2024, 18 data centres were commissioned under the Green Lane Pathway, increasing energy demand by 1.9GW. Overall electricity demand led to a 6.5% increase in electricity sales compared to 3.9% in 2023, driving a 6.9% growth in TNB Group's revenue. (page 22 of IAR 2024)
 - (a) With ever-increasing electricity demand accentuated further by the proliferation of data centres, would there be a severe strain on the electricity supply, and how would the company be able to meet the challenges?
 - (b) How many more data centres are expected to be commissioned by the end of FY 2025, thus further boosting energy demand?
 - Would it be possible to gauge or estimate what percentage of electricity supply to the data centres would be from renewable **(c)** energy?

Answer for (a):

- We monitor our supply and demand closely. Currently, the declared maximum demand by data centre spread over several years (5 to 10 ٠ years) and we have a healthy reserve margin of around 30% to support the demand growth from data centres. The optimal reserve margin for the system is around 20% to 25%.
- With proper demand forecast and system planning (Malaysia has a 20-year Electricity Supply Development Plan, reviewed annually), we ٠ will be able to meet the demand and manage any bottleneck risk. Additional solar capacity that will be coming on stream in the next few years are from the Large Scale Solar Programmes (LSS 5 & LSS 5+) totalling 4,000MW together with 100MW/400MWh of battery storage installations.
- In the most recent development, Suruhanjaya Tenaga has called for proposals (RFP) for gas generation capacity in the year 2025 to 2029 ٠ for Peninsular Malaysia, covering both the extension of existing facility and new generation capacity. These initiatives are part of the generation planning activities by the regulator.

Operational and Financial Matters (2/2)

Answer for (b):

- TENAGA NASIONAL 35th AGM
- As of December 2024, we have secured a total maximum demand of 5.9GW from 38 data centre projects. Out of which, 18 projects at a total maximum demand of 1.9GW is already in the system.
- Based on the Electricity Supply Agreements (ESA) signed in 2024, we have set a target to complete 5 projects by the end of 2025, with a maximum demand of approximately 1.3GW. With the remaining 2.7GW expected to come onstream in 2026. This will further solidify our role in meeting the growing demand for sustainable energy solutions and supporting the nation's economic growth.
- We are still seeing strong interest from data centre investments reflecting steady confidence in the market and expect to sign more ESA this year.

Answer for (c):

- As of FY2024, Renewable Energy (RE) capacity is approximately 19% of the total installed generation capacity in Peninsular Malaysia.
- While there is a growing preference for green energy, TNB is ready to supply green electricity to data centre as per their requirements via multiple RE solutions:
 - i. Green Energy Tariff (GET) Available quota of 6,600GWh (40% utilisation);
 - ii. National Energy Transition Roadmap 2,500MW hybrid-hydro floating solar (HHFS) and 500MW large scale solar projects (Centralised Solar Park) in pipeline; and
 - iii. Large Scale Solar Programme (LSS5 and LSS5+) of 4,000MW.
- Collaboration with power suppliers like TNB facilitates a practical and responsible transition to predominantly green and sustainable energy sources. Options available for data centre consumers for increased green energy are self-consumption via solar rooftop, Green Energy Tariff (GET), Renewable Energy Certificates (REC), Corporate Green Power Programme (CGPP) and Corporate Renewable Energy Supply Scheme (CRESS).
- CRESS is the latest programme that enables corporate entities, including data centres, to access renewable energy more efficiently.
- All these programmes are in place towards achieving the country's RE capacity target of 40% by 2035.

Operational and Financial Matters



2. With a mandate that goes beyond energy, TNB's Retail Division also develops smart energy solutions tailored to diverse customer segments, from large corporations and Small and Medium Enterprises (SMEs) to micro-businesses and residential users—supporting their transition towards a smarter, more sustainable energy lifestyle. (page 13 of IAR 2024)

What positive contributions and benefits does the Group derive from the smart energy solutions and what is the prospect?

Answer:

- **Distributed generation:** Solar PV Solutions provide revenue diversification through solar rooftop installation and maintenance services delivered by our wholly owned subsidiary, GSPARX Sdn Bhd. Offering rooftop solar rooftop solution has enhanced our customer retention by providing end-to-end green energy solutions, directly improving brand positioning as a trusted clean energy advisor, created cross-selling opportunities, and helped customers reduce their carbon footprint while achieving long-term energy cost savings.
- Electric Vehicle Charging Infrastructure TNB is actively expanding its electric vehicle (EV) charging infrastructure across Peninsular Malaysia under the TNB Electron brand. As of December 2024, 66 charge points have been installed, with plans to deploy over 250 additional chargers by 2025. As a Charge Point Operator (CPO), TNB supports national EV adoption goals, enhances convenience for EV users, and opens new digital revenue streams through platform solutions and usage analytics.
- Energy Efficiency & Management Services TNB offers turnkey energy efficiency solutions, including upgrades such as LED lighting, HVAC systems, and automation. These improvements are implemented with cost recovery based on guaranteed energy savings for customers, which include government buildings, educational institutions, and commercial and industrial clients.
- Green Electricity Tariffs (GET) & Renewable Energy Certificates (RECs) are solutions offered via TNB's subsidiary TNBX Sdn. Bhd. These solutions provide individuals and organisations with a flexible and credible way to claim the use of renewable electricity without self generation. These offerings have enabled corporate customers to meet sustainability targets, support green financing eligibility, and qualify for inclusion in sustainable supply chains.
- TNB continues to play a key role to empower a greener lifestyle through these smart and sustainable solutions. These solutions not only enable cleaner energy access but also empower customers to make informed, sustainable choices in their homes, businesses, and modes of transport. By embracing smart energy solutions, Malaysians can take an active role in building a resilient and low-carbon future.

Operational and Financial Matters (1/2)



Tenaga has also ventured into carbon capture and storage space to help reduce emissions from thermal plants. To this end, 3. it is developing carbon capture technology, with a demo unit now which is at 30% completion at the Jimah East Power Plant. Notable domestic RE projects being undertaken by TNB include the 300MW Nenggiri hydro project in Kelantan which has achieved 48% completion. (page 28 of IAR 2024) (a) When is the carbon capture technology expected to be rolled out and what is the expected impact? (b) When is the 300MW Nenggiri hydro project targeted to be completed?

Answer for (a):

- Carbon emissions from thermal power plants continue to pose a critical challenge in the transition towards a low-carbon future. In response, as part of our net zero ambition, TNB has earmarked the use of advanced Carbon Capture & Utilisation (CCU) technologies to contribute 30% of the emission intensity reduction by 2050. Generally, CCU technologies can be clustered into three categories, namely chemical, biological (or bio-CCU), and physical.
- TNB's CCU efforts are currently centered around **both chemical and biological** technologies. ٠
 - (Chemical) The CCUS Pilot (Project Dragon) at Jimah East Power Plant is expected to be completed by end-2026, aiming to capture up to 5,000 kg of CO₂ per year using innovative amine solvent-based technology. The captured CO₂ will support various applications including e-fuel synthesis (methane/ methanol), microalgae cultivation, and CO₂-enriched agriculture aligned with the national High Growth High Value (HGHV) initiative framework. Notably, the project envisions supplying high concentration CO₂ to dragon fruit plantations, which also inspired its name.
 - (Biological) TNB Research is advancing bio-CCU through a Proof-of-Concept (PoC) project via microalgae cultivation in a photo bioreactor. This initiative ٠ marks a strategic step towards future commercialisation of algae-based product for a sustainable solution of bio-CCU.
- TNB has observed a significant cost reduction in carbon capture projects at coal-fired power plants in recent years, driven by technological advancement • and improved efficiency. However, overall cost remains high. Most CCUS projects offset part of their cost by generating revenue from the sale of captured CO2 for Enhanced Oil Recovery (EOR) or industrial applications. To further improve project viability, additional research grants, investment, and government policy support are essential, similar enablers were observed in markets such as USA, China, Japan and Singapore.

Operational and Financial Matters (2/2)



Answer for (b):

The development of the 300MW Nenggiri Hydroelectric Project started in 2022 and is progressing well.

As of December 2024, we have recorded 41% completion as we strive to meet the scheduled Commercial Operation Date (COD) in Q2 2027.

Operational and Financial Matters



4. Regionally, Tenaga is also securing RE supply at the regional level by facilitating trade with neighbouring countries. These include exporting renewable energy to Singapore through Keppel Electric under the LTMS power integration project. Concurrently it signed a 50MW green energy supply deal with Sembcorp in December. (page 28 of IAR 2024)

How much revenue is generated from the energy supply to Singapore? Apart from Singapore, does the Group supply or plan to supply energy to other countries in the region?

Answer:

- At the moment, revenue contribution from energy export is minimal relative to the total revenue of the Group.
- Apart from Singapore, TNB is actively involved in several regional interconnection initiatives aimed at **enabling future electricity trade with neighbouring countries**, in line with the ASEAN Power Grid vision.
- To date, TNB has signed several MOUs with regional counterparts such as Thailand, Indonesia, Laos and Vietnam to explore and advance the development or enhancement of cross-border electricity interconnections.

Operational and Financial Matters (1/2)



- 5. Through its own solar arm, GSPARX Sdn Bhd (GSPARX), Tenaga has successfully secured over 500MW of solar capacity across Peninsular Malaysia. Major development includes projects with Sime Darby Property in Elmina and Bandar Bukit Raja with solar panels installed in their residential, sales galleries, malls, and clubhouses. At these developments there are also customers living in solar-powered homes with the option to sell excess electricity back to the grid. (page 28 of IAR 2024)
 - (a) Apart from projects with Sime Darby Property, is the Group targeting to tie up with more property developers and set up a targeted solar capacity from solar panels installed?

(b) What has been the experience or extent of customers selling excess electricity back to the grid?

Answer for (a):

- GSPARX now has a total of 504MWp rooftop solar capacity, in which 164MWp was secured during the year.
- We have signed with Sime Darby Property, SP Setia and IJM three well-established developers and other developers like Sri Pajam, Teladan Setia and LKPP Property. We are also in discussions with others through various schemes introduced by PETRA, such as Net Energy Metering (NEM), Self-Consumption (SELCO) and the Community Renewable Energy Aggregation Mechanism (CREAM).
- For 2025, GSPARX targets an additional acquisition of 100MWp, and will continue to pursue all different customer segments including residential, commercial and industrial segments.



Operational and Financial Matters (2/2)



Answer for (b):

- Both residential and business customers can sell excess electricity back to the grid under the **Net Energy Metering (NEM)** scheme, which supports the adoption of solar energy and promotes self-generation. Currently, there are three NEM schemes, namely Rakyat, Net Offset Virtual Aggregation (NOVA) and GoMEn.
- As of 2024, there are 55,831 NEM customers with the total excess energy of 470GWh.





- 6. To date, TNB currently has 3.3GW of renewable energy in Peninsular Malaysia and 1.1GW abroad, mainly in the UK and Ireland. (page 27 of IAR 2024)
 - (a) What are the respective percentages of renewable energy (RE) to total energy in Peninsular Malaysia and abroad?(b) What is the percentage breakdown of the various sources of RE?
 - (c) Which sources of RE pose the greatest challenges to generate and how does Tenaga address the challenges?

Answer for (a):

As of FY2024, 3.3GW is 11.3% of total capacity in Peninsular Malaysia, whilst in the UK and Ireland (combined), it is ~1.6% of total capacity.

Answer for (b):

• The gross RE capacity (Peninsular Malaysia and International) breakdown as follows:

Hydro	Solar	Wind	Biomass	Biogas	Total
60.47%	32.79%	6.36%	0.28%	0.10%	100%
2,700MW	1,464MWp	284MW	12.5MW	4.8MW	4,465.3MW



Sustainability Matters (2/2)



Answer for (c):

- Due to abundance of the renewable energy sources in countries we operate, we foresee ample growth opportunities.
- However, some challenges may arise in the development of renewable projects:
 - i. Land scarcity and the right location where potential solution includes the implementation of hybrid-hydro floating solar, both at big lakes and offshore. Under the National Energy Transition Roadmap (NETR), TNB has been entrusted to develop 2,500MW of hybrid-hydro floating solar at our hydro power plants in which we successfully completed the installation of 154kWp pilot project at Kenyir hydro dam in 2024.
 - ii. Intermittency of renewables will be addressed by integrating battery energy storage systems (BESS) which is already part of our grid plan.
 - iii. Exploring potential solution to address low wind speed.
- Our international investments have provided us the capabilities and technology discovery opportunity in operating renewables like solar and wind.
- Looking ahead, in order to address the identified challenges, we aim to boost our renewable energy capacity by designing more efficient, cost-effective plants, leveraging digital technologies to enhance operations, and integrating battery storage to maximise performance and reliability.



Sustainability Matters



7. Biomass as Sustainable Fuel of the Future

In 2024, TNB Fuel Services Sdn. Bhd. (TNBF) supplied and delivered 4,305 metric tonnes of biomass in the form of EFB pellets to Tanjung Bin Power Sdn. Bhd., a subsidiary of Malakoff Berhad, as part of the co-firing project in the NETR. (page 88 of IAR 2024)

(a) Why is there a seemingly reluctance or delay in adopting biomass as sustainable fuel?

(b) What are the obstacles or challenges, if any? Going forward, is the Group planning to use biomass more extensively?

Answer for (a) :

- For biomass, we have completed the pilot phase. In February 2024, TNB announced it has successfully demonstrated the burning of 1% biomass and advancing to the next level by introducing 1% ammonia and 2% biomass co-firing. Earlier, a demonstration (demo) of 1% biomass (EFB pellet) co-firing has been successful at Stesen Janakuasa Tuanku Muhriz (SJTM) between 10 to 14 September 2023, validating the suitability of co-firing to the local climate.
- The demo programme was witnessed by representatives from the regulators and partners, Mitsui, and Chugoku. (Source: <u>https://www.tnb.com.my/announcements/tnb-embarks-on-innovative-co-firing-project-to-advance-energy-transition</u>)

Answer for (b):

• The key challenges for biomass are (i) amount and availability of feedstock; and (ii) cost/commercial consideration – balancing between energy affordability, security and sustainability.