



# TENAGA NASIONAL BERHAD PRESENTATION TO INVESTORS

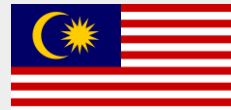
Investor Relations  
Group Finance Division  
June 2023





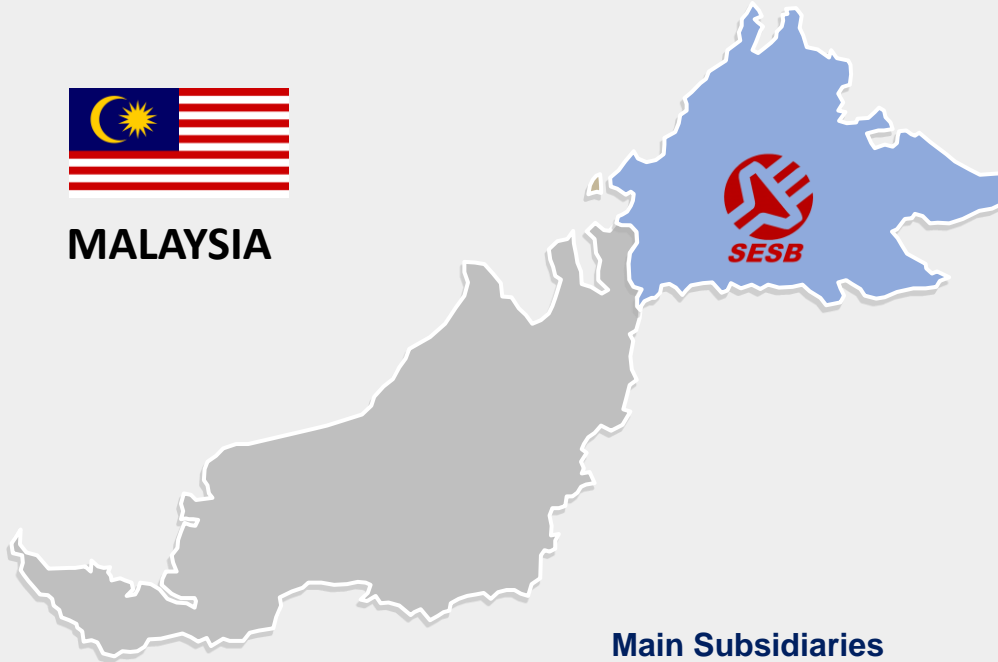
# TNB is the largest electricity utility company in Malaysia and at the forefront of the country's energy transition

Tenaga Nasional Bhd (TNB)






**MALAYSIA**

**Sabah Electricity Sdn Bhd (SESB)**  
 (83% owned by TNB)  
 Dependable Capacity:  
 1,221MW



## Sole Network & Retail Provider in Peninsular Malaysia

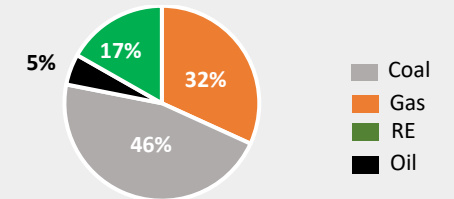
Our grid network & retail business are governed by the Incentive Based Regulation (IBR) framework

-  Transmission length: 25,838 km  
 Substations: 480  
 System Minutes: 0.01 minutes
-  Distribution Network: 741,764 km  
 Substations: 87,947  
 SAIDI : 9.49 minutes
-  Retail customers: 9.9 mil  
 Customer Satisfaction Index (CSI): 87%

## Holds 66% of Domestic Generation Capacity

Total TNB Installed Capacity: 23,239 MW (June 2023)

- Domestic: 18,140 MW
- International: 5,099 MW



Notes:  
 1. RE inclusive of large hydro and small RE  
 2. Data is based on gross installed capacity (exclude SESB)

## Our International Presence



## Main Subsidiaries





We are also a global player; through our New Energy Division (NED), we strive to future proof our business by expanding our RE footprint and establishing strategic partnerships with leading RE players

### NED'S PORTFOLIO

#### 2021 VANTAGE RE

- **Equity stake:** 100%
- **Capacity:**
  - 123.9MW in onshore wind (100% equity)
  - 365.0MW in solar (55% equity)
  - 41.5MW in offshore wind (49% equity)

#### 2018 TNB RENEWABLES

- **Equity stake:** 100%
- **Capacity:**
  - 123.0MW Large Scale Solar (LSS) parks (100% equity)
  - 4.8MW in biogas (49% equity)

#### 2016 GAMA ENERJI A.Ş.

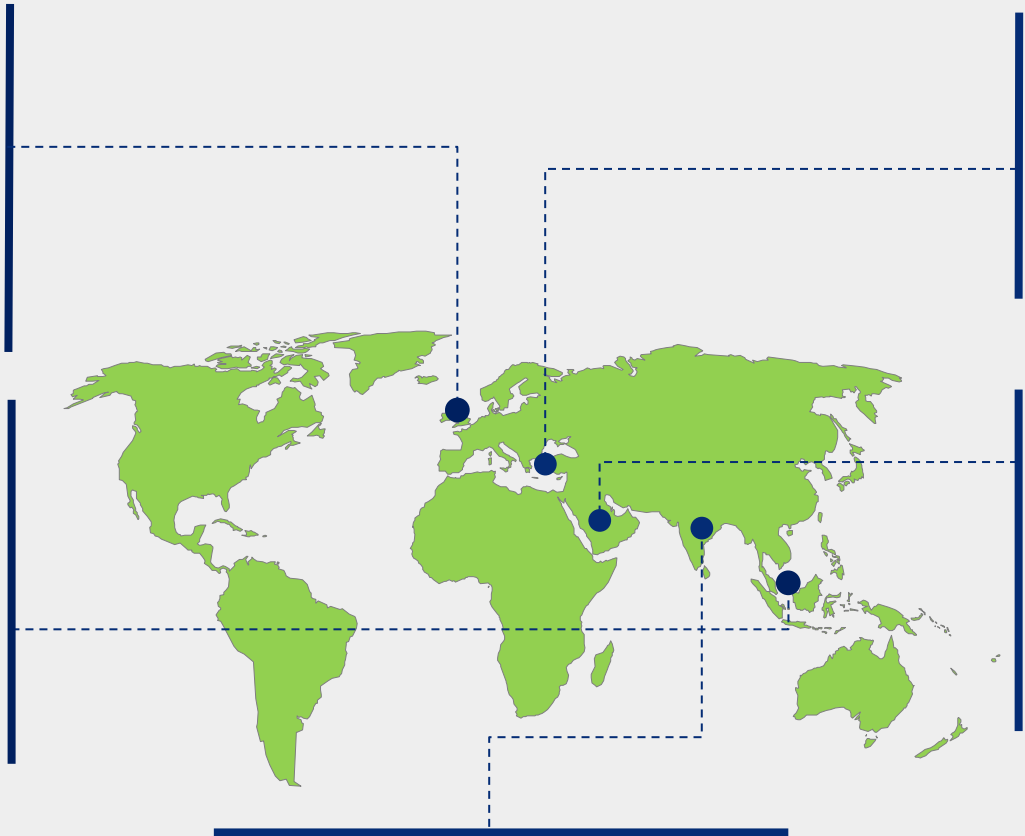
- **Equity stake:** 30%
- **Capacity:**
  - 1,134.1MW in gas, hydro and wind. Water conveyance in Jordan

#### 2005 SEPCO SWEC

- **Equity stake:** 6% effective equity stake
- **Capacity:**
  - 1,190.0MW in IWPP
  - Water desalination of 1,039,000 m<sup>3</sup>/day

#### 2016 GAR

- **Equity stake:** 30%
- **Capacity:**
  - 2,244.0MW in coal, gas, solar and hydro





**CHAIRMAN**  
**DATO' ABDUL RAZAK BIN ABDUL MAJID**



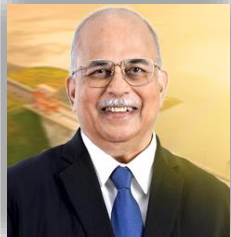
**EXECUTIVE DIRECTOR / PRESIDENT / CEO**  
**DATO' INDERA IR. BAHARIN BIN DIN**

Senior Independent Non-Executive Director



**ONG AI LIN**  
Expertise: Audit & Finance

Independent Non-Executive Directors



**GOPALA KRISHNAN K.SUNDARAM**  
Expertise: Law



**JUNIWATI RAHMAT HUSSIN**  
Expertise: Corporate Planning and Human Resource



**DATO' ROSLINA BINTI ZAINAL**  
Expertise: Engineering & Business



**DATO' MERINA BINTI ABU TAHIR**  
Expertise: Accounting

Non-Independent Non-Executive Directors



**DATUK AMRAN HAFIZ BIN AFFIFUDIN**  
Khazanah Nasional Berhad



**ELAINE ONG YEE LYNN**  
Alternate Director to Datuk Amran Khazanah Nasional Berhad



**ROHAYA BINTI MOHAMMAD YUSOF**  
Employees Provident Fund (EPF)



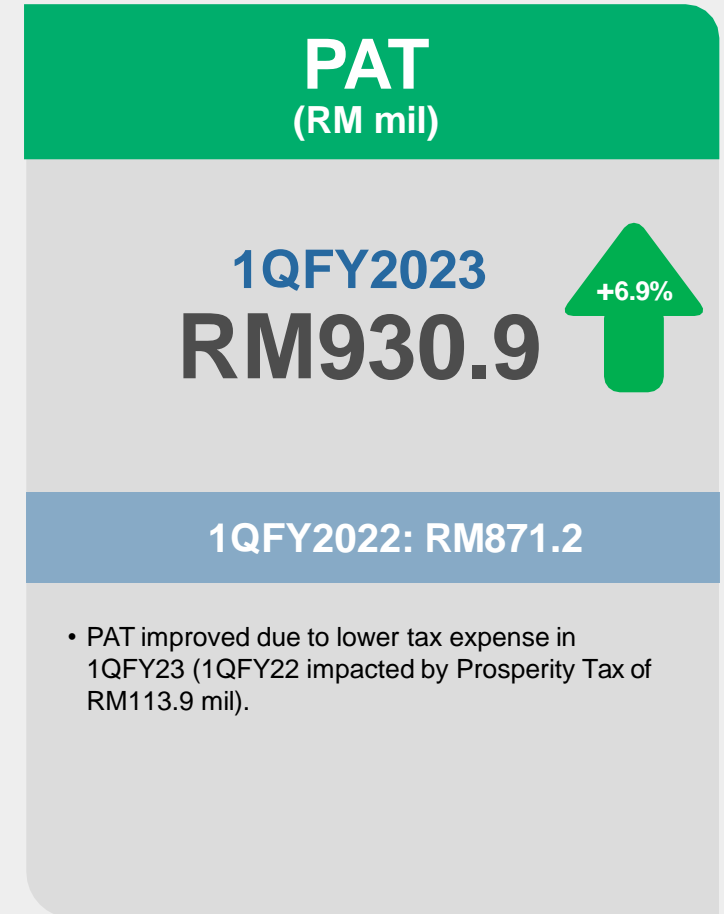
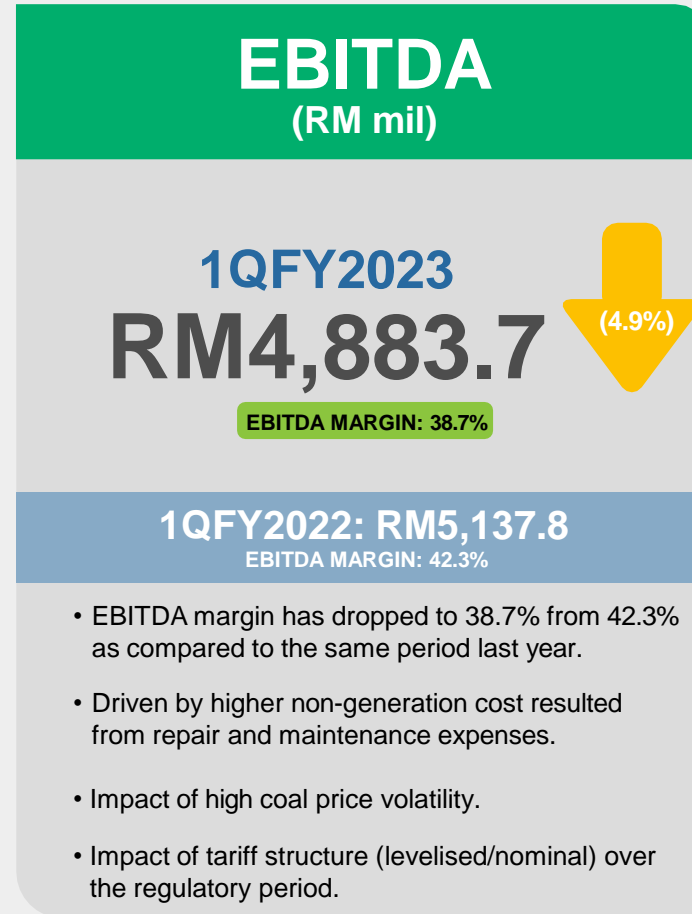
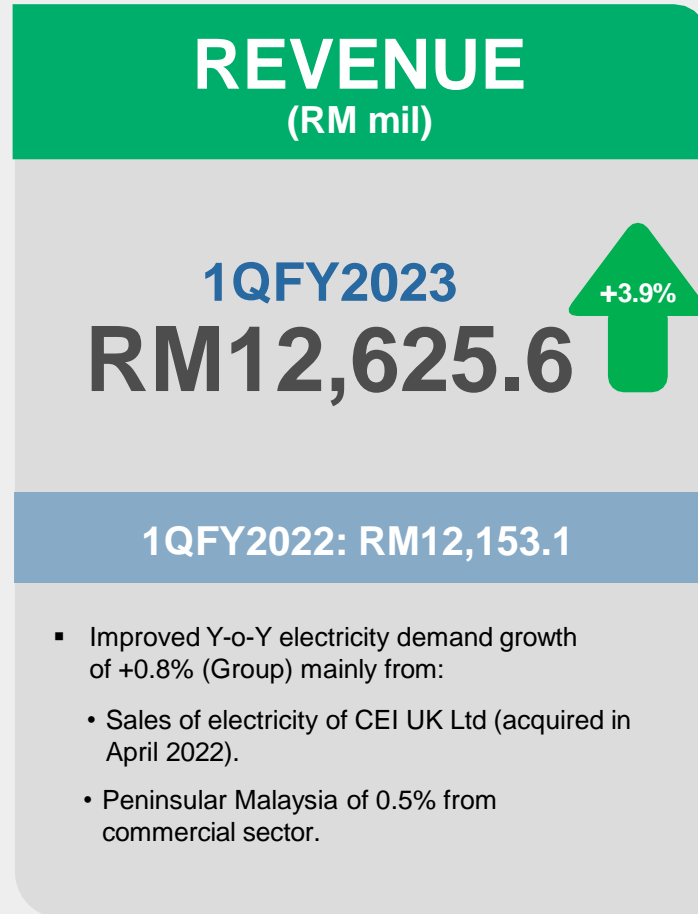
**DATIN RASHIDAH BINTI MOHD SIES**  
Ministry of Finance



**MUAZZAM BIN MOHAMAD**  
Permodalan Nasional Berhad (PNB)




## Improved earnings despite challenging environment






# Group earnings supported by; (i) Improved generation business (ii) World-class network performance




Equivalent Plant Availability Factor, EAF (Generation) %

**1QFY2023**  
**84.41%**  
FY2022: 83.2%  
2023 Target: 81.80%




EAF performance secured **generation assets' capacity revenue**




System Minutes (Transmission) Minutes

**1QFY2023**  
**0.01**  
FY2022: 0.2  
2023 Internal Threshold: 2.00



World class network performance safeguarded our regulated business earnings

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SAIDI (Distribution Network) Minutes

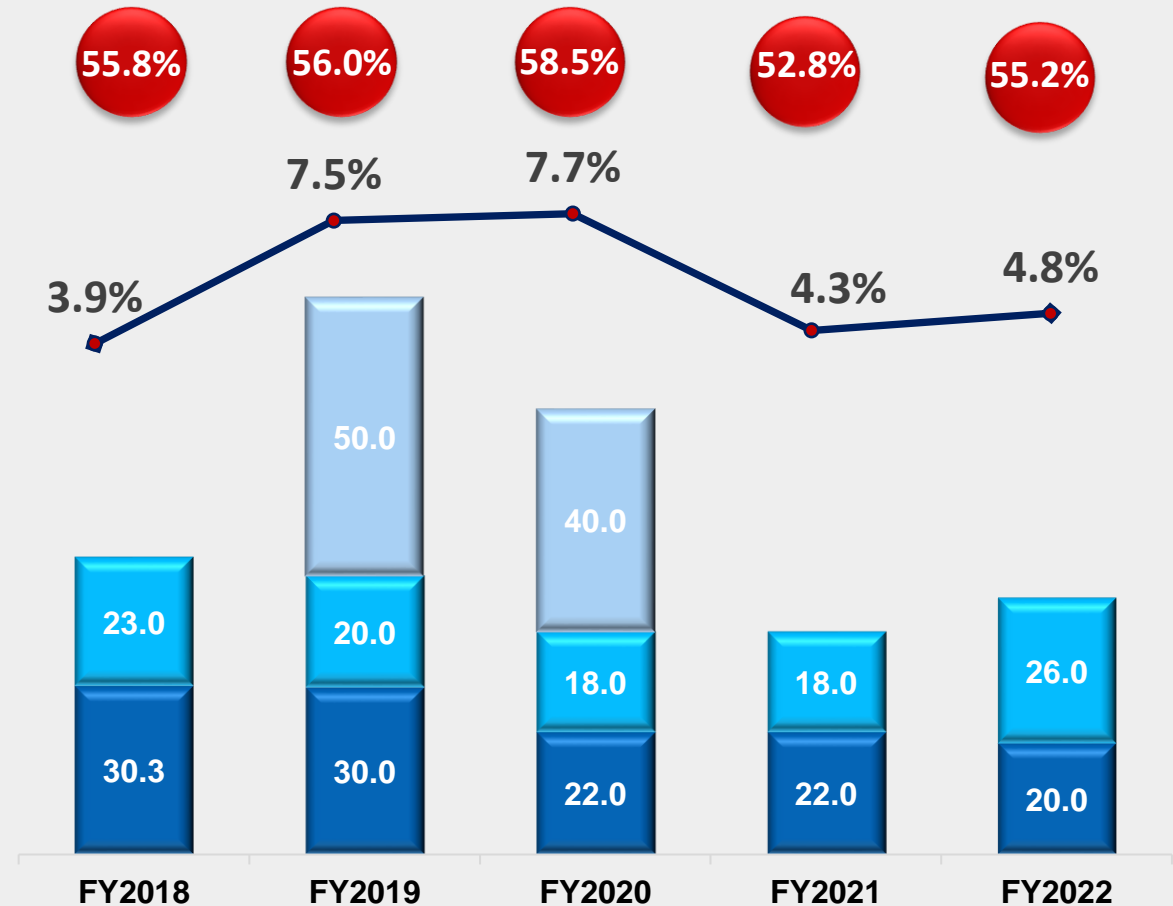
**1QFY2023**  
**9.49**  
FY2022: 45.1  
2023 Internal Threshold: 53.0



We strive for sustainable dividends to ensure long term value for the shareholders, proven by our historical dividend payout record

### DIVIDEND POLICY

We will continue to honour our dividend policy of 30% to 60% dividend payout ratio, based on the reported Consolidated Net Profit Attributable to Shareholders After Minority Interest, excluding Extraordinary, Non-Recurring items



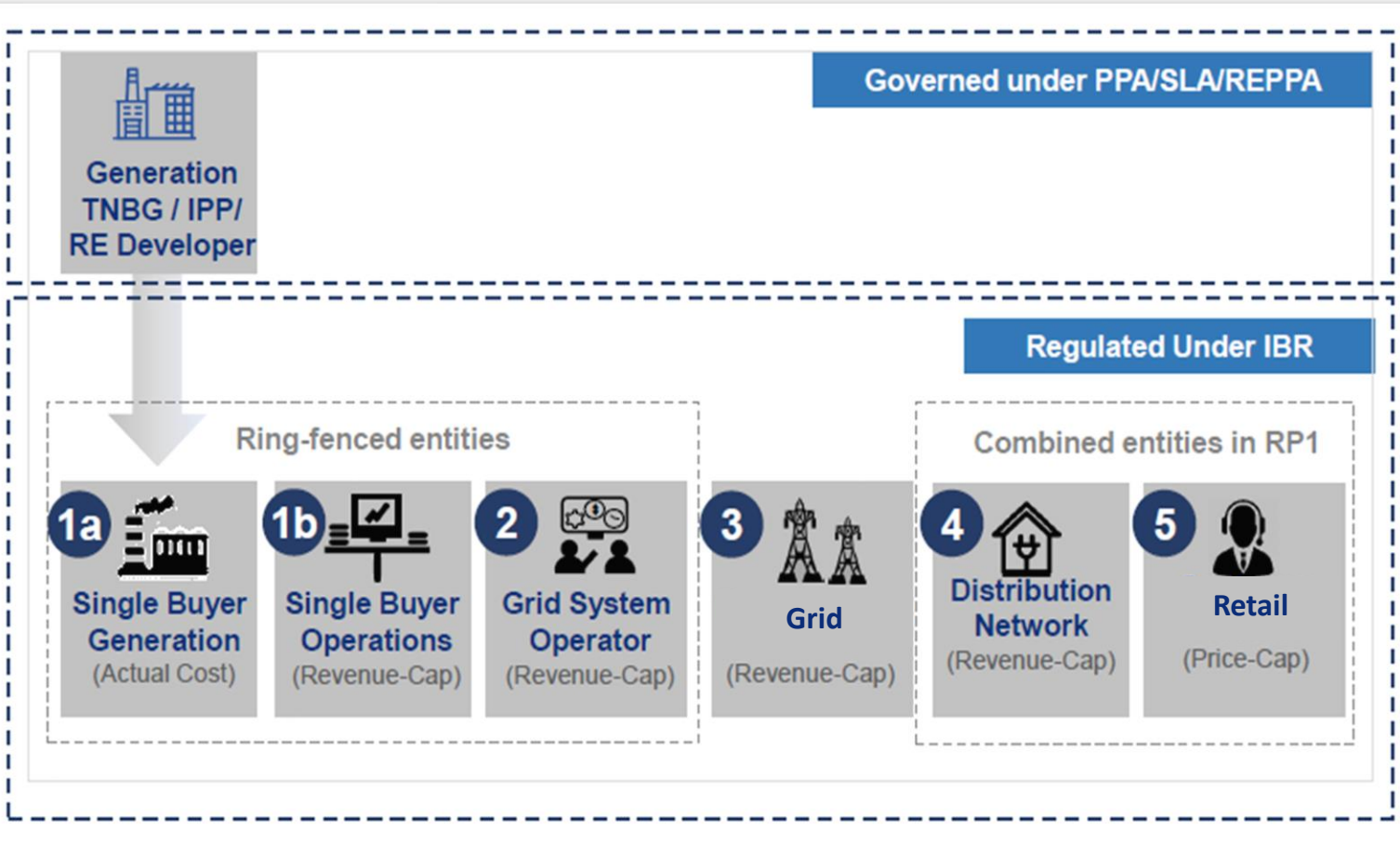
■ Interim dividend per share (sen) ■ Final dividend per share (sen) ■ Special dividend per share (sen)

● Dividend Payout ratio (%) (based on Adjusted Group PATAMI and excluding special dividend)

◆ Dividend Yield



Our regulated business is governed by the Incentive-Based Regulation (IBR) framework which provides stable returns to the Group while ensuring a more efficient energy sector



**The IBR mechanism provides:**

- Clear and transparent regulatory framework
  - Consistent and stable returns
  - Shield against uncontrollable swings
  - Incentives for operational efficiencies
- Regulated business made up more than 70% of the overall Group earnings.
  - **Revenue cap:** Allowed annual revenue based on approved demand growth. Any excess/shortfall is adjusted through revenue adjustment mechanism.
  - **Price cap:** Any excess/shortfall of revenue made due to higher/lower average selling price compared to base tariff is adjusted through revenue adjustment mechanism.





The Government has approved the RP3 parameters and we have secured higher CAPEX with a fair WACC for the next 3 years (2022-2024)

RP3 determination (2022 -2024)



Base Tariff, sen/kWh

39.95

RP2: 39.45

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7.3

RP2: 7.3

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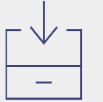
20.555

RP2: 18.8

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70.8

estimated closing  
2024 RAB



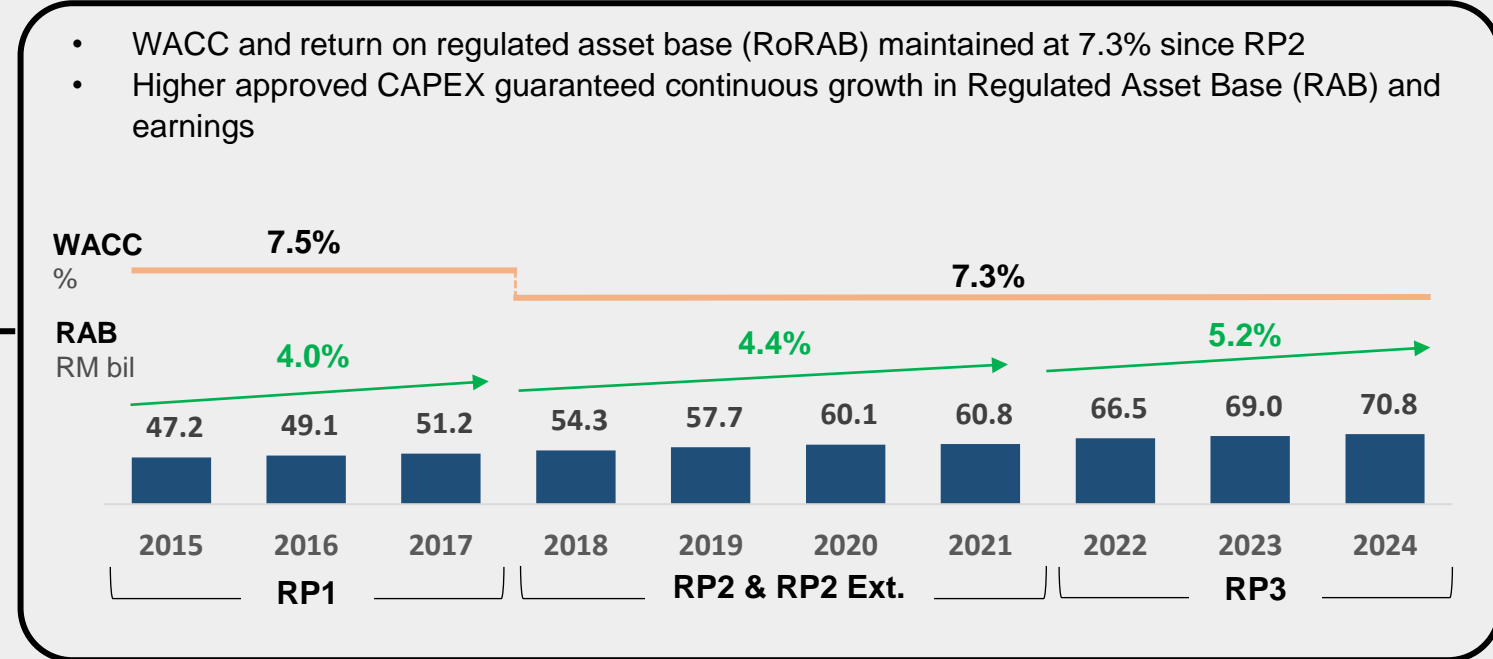
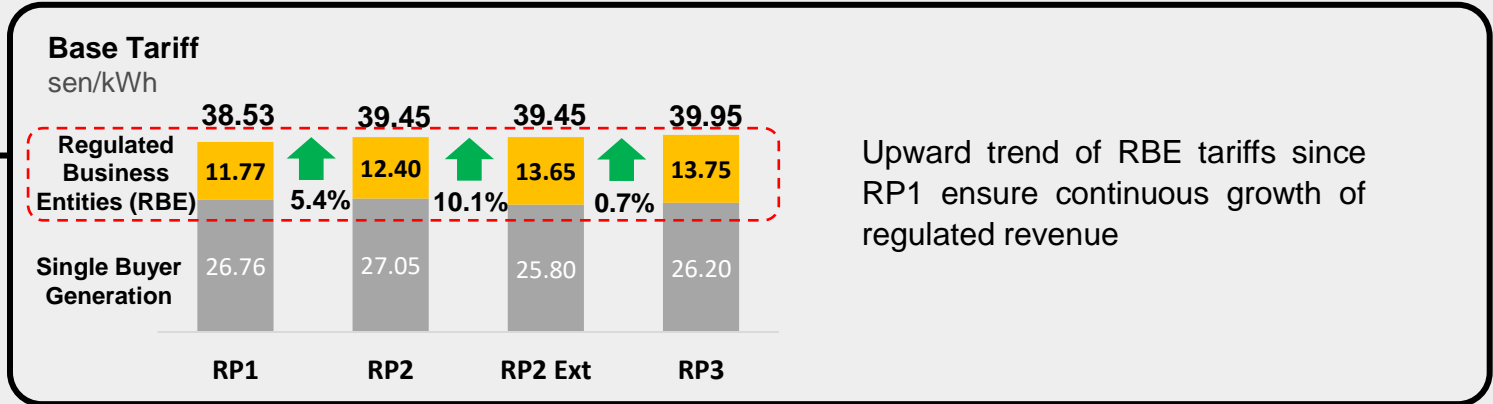
WACC, %



CAPEX, RM bil

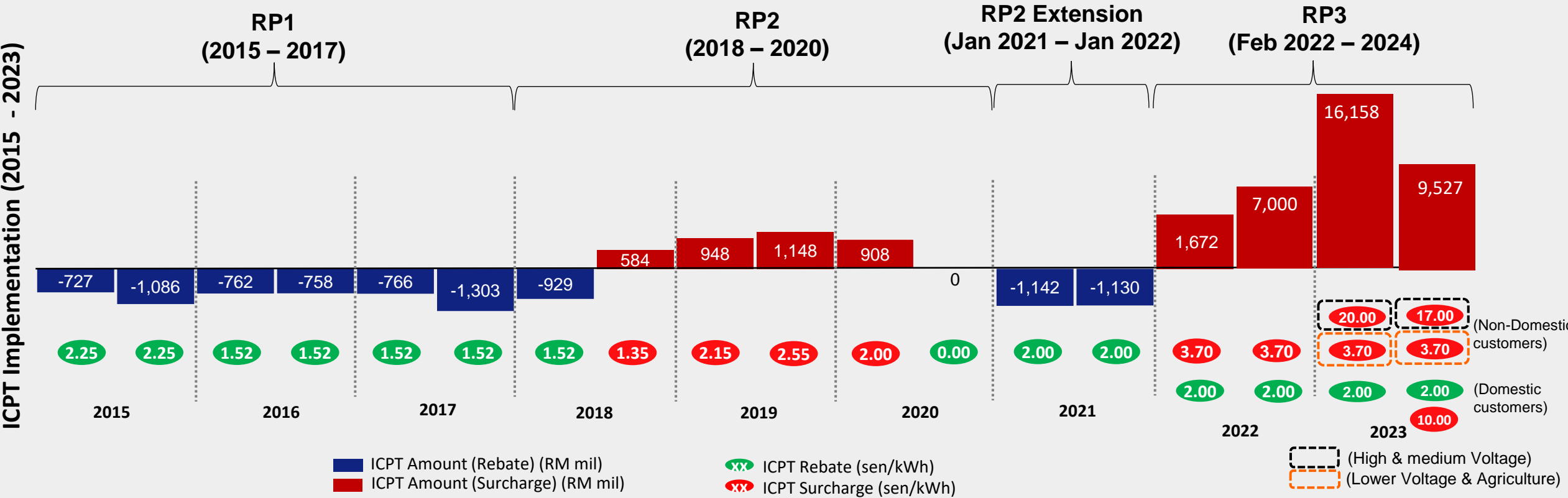


RAB, RM bil





To date, the Government has successfully managed the impact of fuel prices volatility for the past 18 ICPT\* cycles since 2015



Amidst the high global fuel price environment, TNB managed to recover the additional costs with government support:



**ICPT Cost Recovery**

TNB will fully recover the total RM9.5 bil net imbalance cost via:

- The ICPT surcharge passed-through to customers at 10.0 sen/kWh, 3.70 sen/kWh and 17.0 sen/kWh.
- Cost recovery from the Government of **RM4.7 bil.**



**Government Guarantee**

The Government has provided Government guarantee of RM6.0 billion to support TNB's working capital

\*Imbalance Cost Pass-Through



# The Malaysian Government's commitment towards Net Zero at COP26; our Energy Transition Plan supports the nation's climate commitments



## Malaysia Climate Commitments

- ❑ Committed to **45% reduction of GHGs by 2030**
- ❑ Committed to become **carbon neutral as early as 2050**
- ❑ Established the **Joint Committee on Climate Change** to build climate resilience within Malaysian financial sector
- ❑ Established a mandate to develop a **voluntary carbon market to promote offsetting**



## Key focus areas to facilitate the transition to carbon neutrality

### Encourage low-carbon economy transition

- Implement carbon pricing policy
- Implement the Low Carbon Mobility Blueprint 2021-2030 which outlines low-carbon alternatives
- Increase renewable energy generation capacity to 31% in 2025 and 40% in 2035
- Transform cities toward low-carbon pathway outlined in the National Low Carbon Cities Masterplan

### Protect the environment and biodiversity

- Implement nature-based solutions to lower GHG with planting up to 100 million trees
- Maintain at least 50% forest cover
- Adopt Zero Waste through the Waste to Energy programme and improve recycling rate to 40% by 2025

### Climate change adaption

- National resilience to climate change through the National Adaptation Plan



**We are committed to our Energy Transition Plan – The journey towards Net Zero 2050 Aspiration will bring positive business growth and enhance value to our shareholders**

## Net Zero 2050 Aspiration

### Our Target for 2025

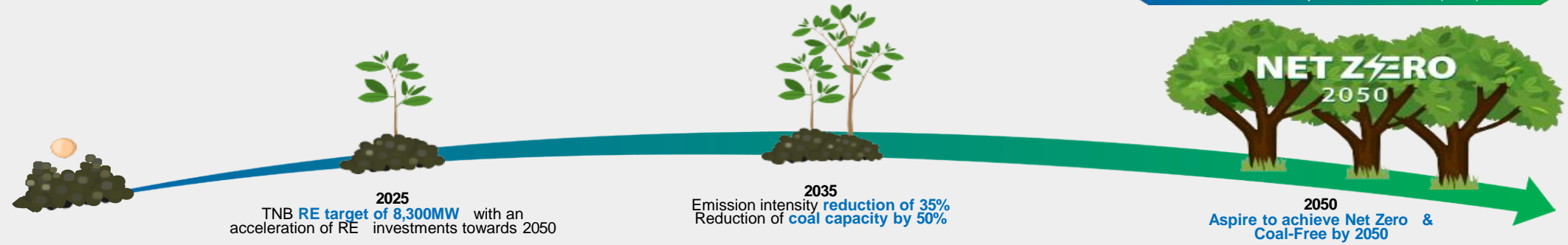
- Build scale in renewable generation
- Improve thermal plant efficiency

### Our Commitment to 2035

- Significant renewable generation growth
- 50% reduction in coal generation capacity

### Our Aspiration to 2050

Invest and grow our emerging green technologies including Hydrogen and Carbon Capture & Utilisation (CCU)



### EBIT Projection

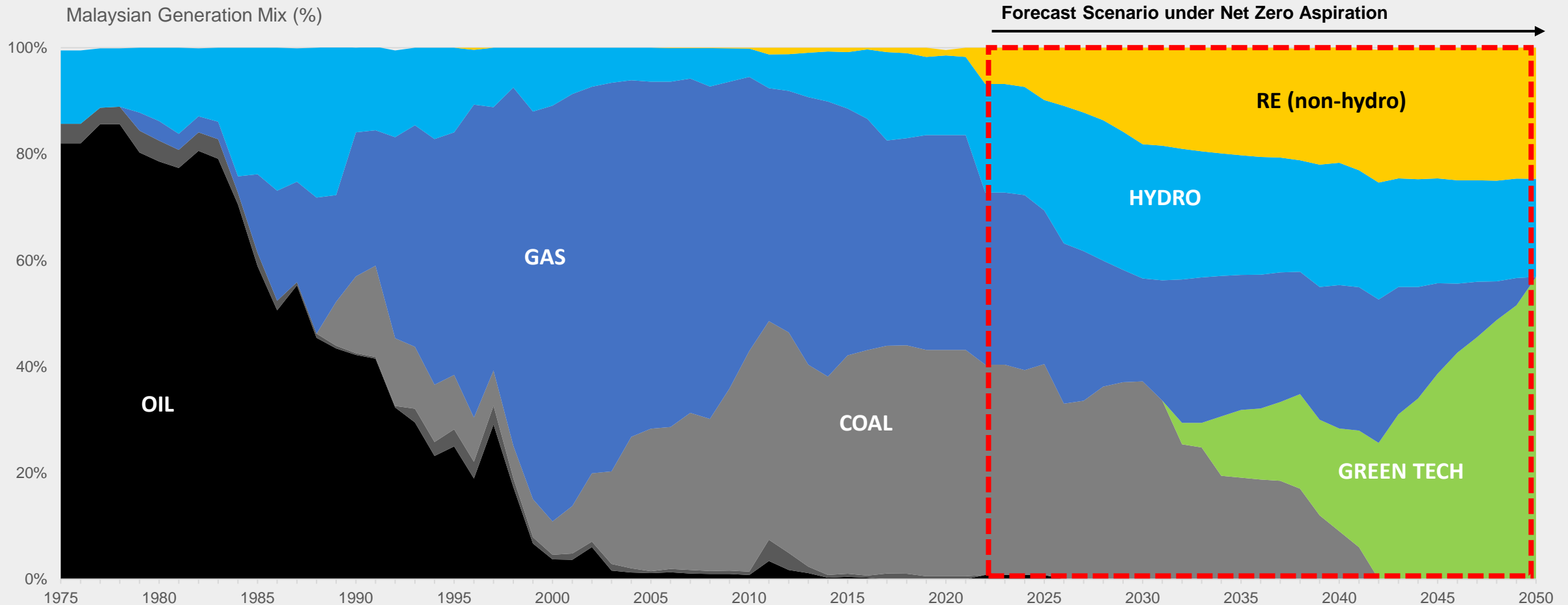


**Ranked 1<sup>st</sup> in the region and 42<sup>nd</sup> in the overall international ranking for Global ESG Monitor**

We believe our pathway will bring positive business growth to the Group while **creating long-term value to our shareholders** through earnings growth.



The nation's current generation mix reflects the diversification required for security of supply, and will continue to shift as we take a responsible approach towards energy transition



- Historically, Malaysia's generation mix was dominated by the use of oil as we transitioned into gas and then coal
- Moving forward, RE will grow significantly as costs rapidly decline**
- Green Tech (Green Hydrogen, Gas + CCUS) will be a key lever in decarbonisation**



# TNB's fast-track sustainability agenda will see major shifts across the value chain in meeting our ESG commitment while ensuring business growth

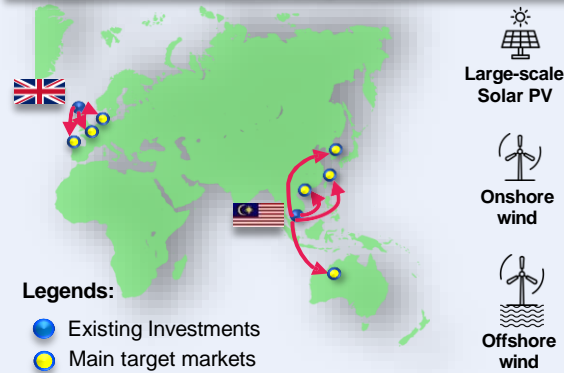
## Energy Sources

GenCo aims to capture estimated RM40 bil revenue from domestic market by 2050

NED aims ~USD7 bil Equity investment by 2050

### Fast track decarbonisation

- 1 Coal plants early retirement
- 2 Repowering plants with cleaner fuel and green tech
- 3 Strategic partnership technology



- Large-scale Solar PV
- Onshore wind
- Offshore wind

### Explore opportunities in ASEAN



- Increase enterprise value and sustainability position of GenCo
- Possibility of an IPO of GenCo

Pipeline capacity: 4.5GW  
(Existing total assets: 15.7GW\*)

FOCUS MARKETS



14.3GW by 2050  
(Average portfolio return of 7% – 9%)

Pipeline capacity: 4.4GW  
(Existing RE assets: 1.1GW\*)

## Energy Vector

Regulated asset base (RAB) for Grid + DN to grow to ~RM100 bil by 2050

- Spurring growth of Variable Renewable Energy (VRE) and Distributed Energy Resources (DER)
- Propelling growth of transportation and industrial customers electrification
- Reducing carbon footprint and preserving the forestry & natural environment

### Regional Interconnection

To strengthen security of supply and open investment opportunities



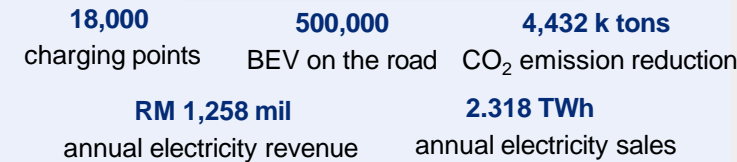
Potential Earnings by 2050: ~RM7 bil

## Energy Usage

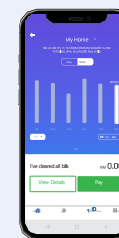
We will invest RM90 mil to support BEV ecosystem over the span of 3 years with the following key strategic moves:

- 1 Build charging infrastructure
- 2 Reskill & upskill workforce
- 3 Lead by example through TNB Fleet electrification
- 4 Sponsor EV-related studies
- 5 Foster coalition among EV sector players

### 2030 EV Market Potential



### Driving changes in customer behaviour via myTNB



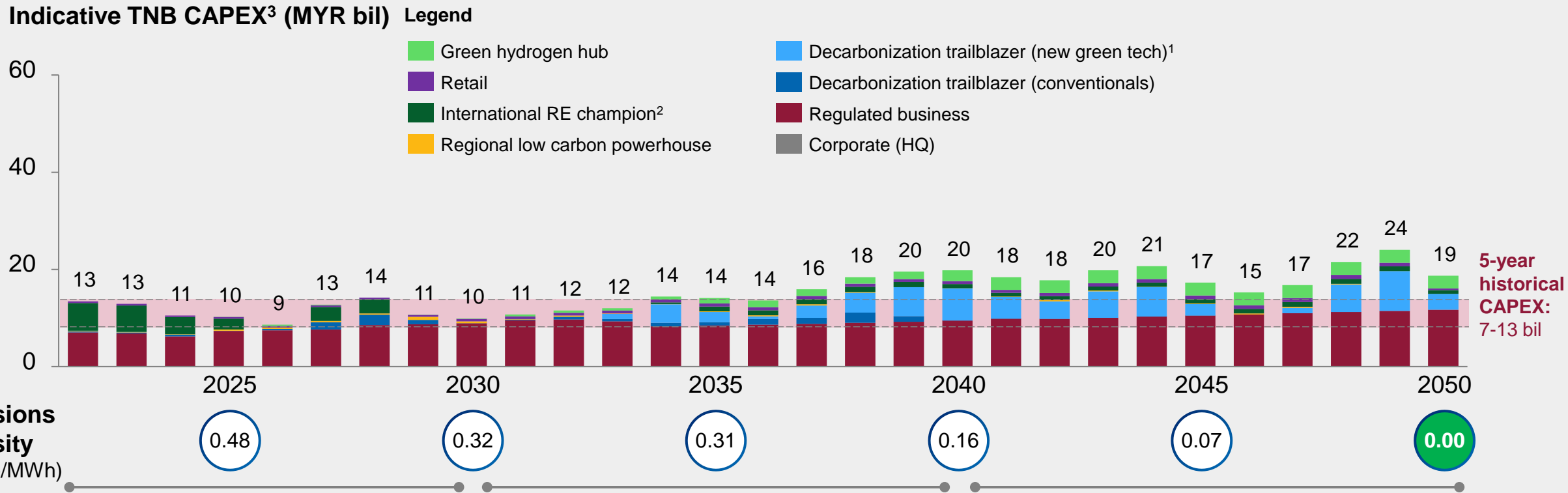
100% increase to ~250k users of Energy Budget features via myTNB (2025):

- 8,071 tonnes of CO2 avoided from the potential savings of ~11GWh in household energy consumption

\*Gross capacity



# Pathway will require investment of 10-20 bil MYR yearly over the next 30 years



**Key investment drivers**

- |   | 2020s  | 2030s  | 2040s |
|---|--|--|-------|
| <ul style="list-style-type: none"> <li>Pursue RE in MY &amp; globally (RE growth to offset plant expiry / early retirement)</li> <li>Use proceeds of coal partnership (2025) and NE-co IPO (2028) to fund RE</li> </ul> | <ul style="list-style-type: none"> <li>Begin repowering into new green techs in 2035</li> <li>Rely on gas plants as transition fuel while waiting for new green techs to scale up</li> <li>Retire newer coal plants earlier (4 years)</li> <li>Establish and grow adjacent businesses (e.g., green H<sub>2</sub> production, EV charging)</li> </ul> | <ul style="list-style-type: none"> <li>Pursue new green techs more aggressively as economics improve and CAPEX headroom increases from returns in earlier investments</li> <li>Phase out gas plants by 2049</li> <li>Expand green H<sub>2</sub> business to tap into rapidly increasing domestic demand</li> </ul> |       |

Indicative

Annual CAPEX

Total CAPEX

<b>MYR 9-14 bil</b>	<b>MYR 10-20 bil</b>	<b>MYR 15-24 bil</b>
<b>MYR ~90 bil</b>	<b>MYR 140-145 bil</b>	<b>MYR 210-215 bil</b>

1. New green tech includes nuclear SMR, CCGT + CCUS, and green H<sub>2</sub> CCGT; 2. RE includes solar and wind; 3. CAPEX accounts for equity stake; Source: Internal analysis,




For 2023, we will continue to drive our strategic initiatives in reaching our Net Zero commitments while ensuring business growth

Energy Sources
GenCo

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**Hydro**



**Sungai Perak LEP Project (650.75MW)**


- Finalised New PPA

**Nenggiri Hydro Project (300MW)**

- COD: Q2 2027
- % of completion as of Apr'23: 27.7%

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**Gas**



**Paka Repowering (1,400MW)**

- Establishment of Feasibility Study


**New Combined Cycle Gas Turbine Kapar (2,100MW)**

- Collaborative Agreement with partner


FY2023: ~RM1.5 bil

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**Recent Collaboration**



A subsidiary of TNB Power Generation




MOU between TNB Repair and Maintenance Sdn. Bhd. (TNB REMACO) and North Power Service Joint Stock Company (EVNNPS)

Energy Vector
Grid

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**1 Regional Interconnection:**



**Malaysia – Singapore Interconnection**

- Currently, finalising other relevant agreements and licensing, and plant preparation is in progress.


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**Collaboration with PT Perusahaan Listrik Negara (PLN)**

- Discussions are still on-going
- The land for the converter station has been identified and secured at Telok Gong, Melaka.

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**Collaboration with Electricity Generating Authority of Thailand (EGAT)**

- Joint Working Committee (JWC) was formed to conduct the feasibility study with target completion of August 2023


FY2023 ET Related CAPEX: ~RM2.99 bil

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**Recent Collaborations**



Electricite Du Laos (EDL)



Saigon Gia Dinh Electric Joint Stock Company (EHCMC)





# Our collaboration with GDS signals positive demand and system growth for TNB in Malaysia

2

## Pipeline Data Centre Projects with maximum demand of 4,300MW

- High Voltage demand has rapidly increased in Malaysia mainly from the manufacturing companies and hyperscale data centres.
- TNB has secured data centre (DC) investments in Malaysia from major companies around the globe with a total maximum demand of **760MW** to date.
- **DCs have requested for green energy to be provided into their facility as part of ESG initiatives for their companies.**



TNB aims to provide beyond-kWh solutions including solar roof top solutions, Green Energy Tariff (GET) and cooling solutions



Solar PV Rooftop Solution via GSPARX



Fiber Connectivity Network via Allo



Provide Data Centre or IT based company with high cooling power consumption via TNEC



Offers Green Electricity Tariff

## Strategic Collaboration & Partnership with GDS Data Centre



TNB



GDS

- TNB and GDS collaboration, via an Electricity Supply Agreement (ESA), was sealed in October 2022 to fulfil the power requirement of GDS data centre campus at the Nusajaya Tech Park in Johor Bahru.
- GDS data centre is expected to start operations with an interim supply of 16MW in mid-2023.
- Plans are underway to ensure the increased maximum demand of 85.5MW is delivered within 2023.
- TNB is fully committed in delivering timely and reliable electricity supply to the project within the agreed timeframe.



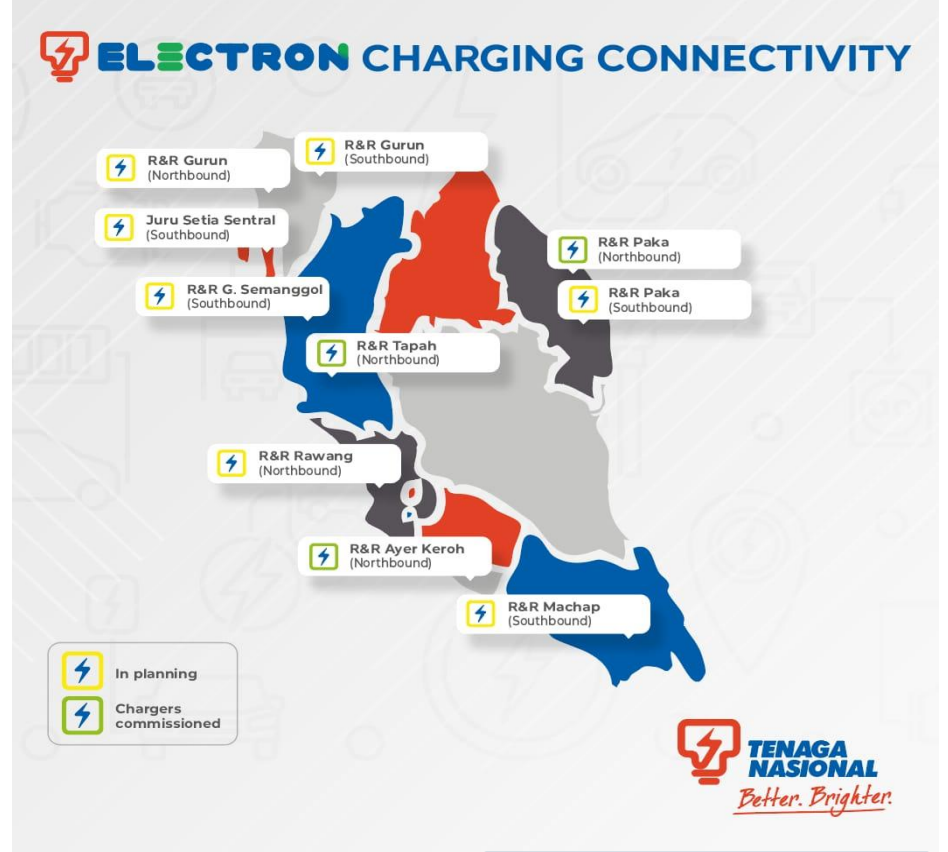
# TNB is committed to strengthening the Electric Vehicle Ecosystem towards the proliferation of EVs in Malaysia

1

## Electric Vehicle (EV) Ecosystem



16 February 2023: Launching of the first TNB Electron vehicle charging facility at Ayer Keroh (Northern Direction)



**2023 Outlook** : TNB to invest ~RM31 million in 2023 to spur the development of EV ecosystem and fleet electrification

- Deployment of 40 EV chargers along Peninsular highway and trunk roads. To date, TNB has identified 21 locations along highway roads and trunk roads.
- Collaborate with local petrol stations on EV chargers at Peninsular trunk roads.
- Development of TNB Electron Hub with Gamuda.
- Electrification of TNB fleet.

3 electron charging stations installed to date

7 additional upcoming charging stations in 2023



# GSPARX<sup>1</sup> provides the ‘extra’ push on renewable energy penetration while growing TNB’s revenue source

2

## Collaboration with AEON

- GSPARX is collaborating with AEON for the installation of rooftop solar PV systems across 40 AEON and AEON BiG shopping malls nationwide.
- Installation agreement is the **largest to date** for GSPARX with a total capacity of **78MWp**.
- GSPARX installed the first PV facility back in October 2022 at AEON Alpha Angle, Wangsa Maju. The 1,513kWp PV solar was installed on the rooftop and the open car park at ground level.
- For 2023, GSPARX will install the PV solar facilities at 11 AEON Malls. The installation of solar systems at all 40 AEON and AEON BiG shopping centres nationwide will be completed by the end of 2024.



**GSPARX aims to secure additional ~145MWp for 2023**

Rapid growth since inception	<b>1,926</b> Projects secured	<b>272</b> MWp capacity	<b>RM70 mil</b> 2023 Expected Revenue
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<sup>1</sup>GSPARX Sdn. Bhd. (GSPARX) is a wholly owned subsidiary company of TNB Renewable Sdn. Bhd. (TRe), a company within the Tenaga Nasional Berhad (TNB) Group. For more info: <https://www.gsparx.com/Pages/AboutUs>

# Thank you

## **INVESTOR RELATIONS GROUP FINANCE DIVISION**

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