

TENAGA NASIONAL BERHAD

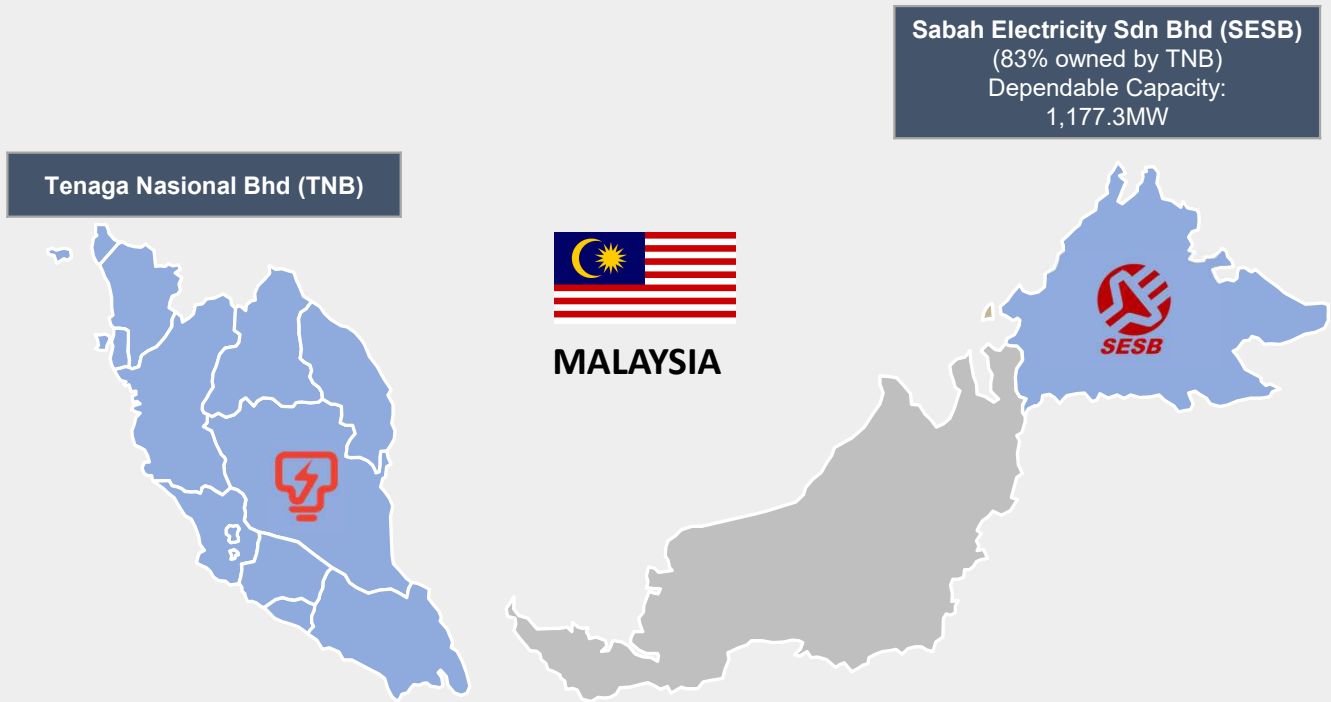
PRESENTATION TO INVESTORS



Investor Relations
Group Finance Division
March 2024






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



Sole Network & Retail Provider in Peninsular Malaysia*

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

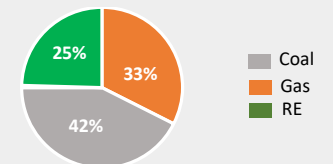
-  Transmission length: 25,838 km
Substations: 480
System Minutes: 0.5 minutes
-  Distribution Network: 741,764 km
Substations: 87,947
SAIDI : 46.1 minutes
-  Retail customers: 10.2 mil
Customer Satisfaction Index (CSI): 88%

*Data as of Feb 2024

Holds 57% of Domestic Generation Capacity

Total TNB Equity Capacity: 15,972MW (December 2023)

- Domestic: 14,814MW
- International: 1,158MW



Notes:

1. RE inclusive of large hydro and small RE
2. Data is based on equity installed capacity (exclude SESB)
3. Solar capacity based on MWp

Main Subsidiaries





We are also a global player as we strive to future proof our business by expanding our RE footprint and establishing strategic partnerships with leading RE players

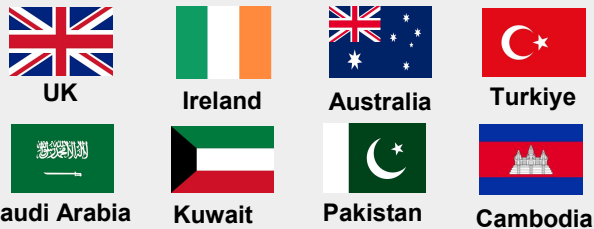
2021 **VANTAGE RE**

- **Equity stake:** 100%
- **Capacity:**
 - 123.9MW in onshore wind (100% equity)
 - 365.0MW in solar (55% equity)
 - 41.5MW in offshore wind (49% equity)
 - 276.0MW in solar (100% equity)

2016 **GAMA**
ENERJİ A.Ş.

- **Equity stake:** 30%
- **Capacity:**
 - 1,151.5MW in gas, hydro and wind.
 - Water conveyance in Jordan

Our International Presence

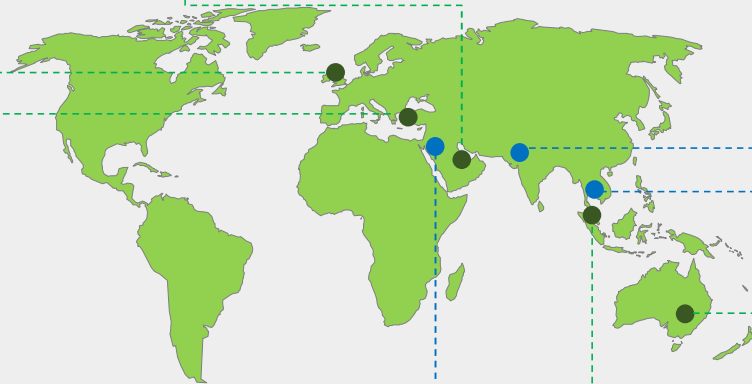


— New Energy Division — Remaco

INTERNATIONAL PORTFOLIO

2005

- **Equity stake:** 6% effective equity stake
- **Capacity:**
 - 1,190.7MW in oil
 - Water desalination of 376 mcm p.a.



- **Operation & Management Services:**
 - Maintenance Services Agreement Mechanical Works (Doha West Plant)
 - Instrumentation & Control Systems (Shuwaikh Power Plant & Doha West Plant)



- **Operation & Management Services:**
 - TNB Remaco & Balloki Power Plant National Power Park Management Company Limited



- **Technical Advisory:**
 - Technical Advisory for Electricité du Cambodge (EDC) Heavy Fuel Oil Plant of 400MW

2023 **Spark Renewables**

- **Equity stake:** 100%
- **Capacity:**
 - 120.5MWp in Solar

2018 **TNB RENEWABLES**

- **Equity stake:** 100%
- **Capacity:**
 - 123.8MW Large Scale Solar (LSS) parks (100% equity)
 - 4.8MW in biogas (49% equity)



Overview **Composition of BOD**



CHAIRMAN
DATO' ABDUL RAZAK BIN ABDUL MAJID



EXECUTIVE DIRECTOR / PRESIDENT / CEO
DATUK IR. MEGAT JALALUDDIN BIN MEGAT HASSAN

**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



**MUAZZAM BIN
MOHAMAD**

Permodalan Nasional
Berhad (PNB)



**YB. TUAN RAMZI BIN
MANSOR**

Ministry of Finance
(MOF)



**ROHAYA BINTI
MOHAMMAD YUSOF**

Employees Provident
Fund (EPF)



**SELVENDRAN
KATHEERAYSON**

Khazanah Nasional Berhad


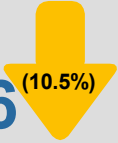
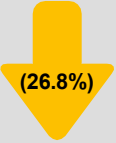


**ELAINE ONG
YEE LYNN**

Khazanah Nasional Berhad
Alternate Director



Amid a steady recovery in demand, our FY2023 PAT was impacted by generation underperformance and negative fuel margin

REVENUE (RM mil)	EBITDA (RM mil)	PAT (RM mil)
<p>FY2023 RM53,066.9 </p> <p>FY2022: RM 50,867.7</p> <ul style="list-style-type: none"> Improved Y-o-Y electricity demand growth of 3.9% (Group) mainly from: <ol style="list-style-type: none"> Peninsular Malaysia of 3.6% from commercial and domestic sector; and Sales of electricity from TNBI operations amounting to RM238.7 mil. 	<p>FY2023 RM18,622.6 </p> <p>EBITDA MARGIN: 35.1%*</p> <p>FY2022: RM20,812.0 EBITDA MARGIN: 40.9%</p> <ul style="list-style-type: none"> While the regulated business recorded a stable performance, the generation business was impacted by negative fuel margin and lower revenue from capacity rate financial (CRF) step down. Y-o-Y EBITDA margin declined to 35.1% from 40.9% mainly due to: <ol style="list-style-type: none"> Impact of negative fuel margin of RM618.7 mil (EBITDA without negative fuel margin: RM19,241.3 mil); and Higher repair and maintenance cost of RM531.0 mil from Distribution Network but within the IBR approved level. 	<p>FY2023 RM2,603.6 </p> <p>FY2022: RM3,557.4</p> <ul style="list-style-type: none"> Impact of negative fuel margin on PAT FY2023 was cushioned by: <ol style="list-style-type: none"> Lower tax expenses; and Higher finance income.

*EBITDA margin (excl. fuel margin): 36.3% (FY2022 38.7%)



Group earnings supported by strong and world-class network performance



Equivalent Plant
Availability Factor, EAF
(Generation)
%

FY2023

83.3%

FY2022: 83.2%

2023 Target: 81.8%

2024 Target: 78.6%



EAF performance secured
generation assets'
capacity revenue



System Minutes
(Transmission)
Minutes

FY2023


0.5

FY2022: 0.2

2023 Internal Threshold: 2.0

2024 Internal Threshold: 1.5



World class network 
performance safeguarded our
regulated business earnings



SAIDI
(Distribution Network)
Minutes

FY2023

46.1

FY2022: 45.1

2023 Internal Threshold: 53.0

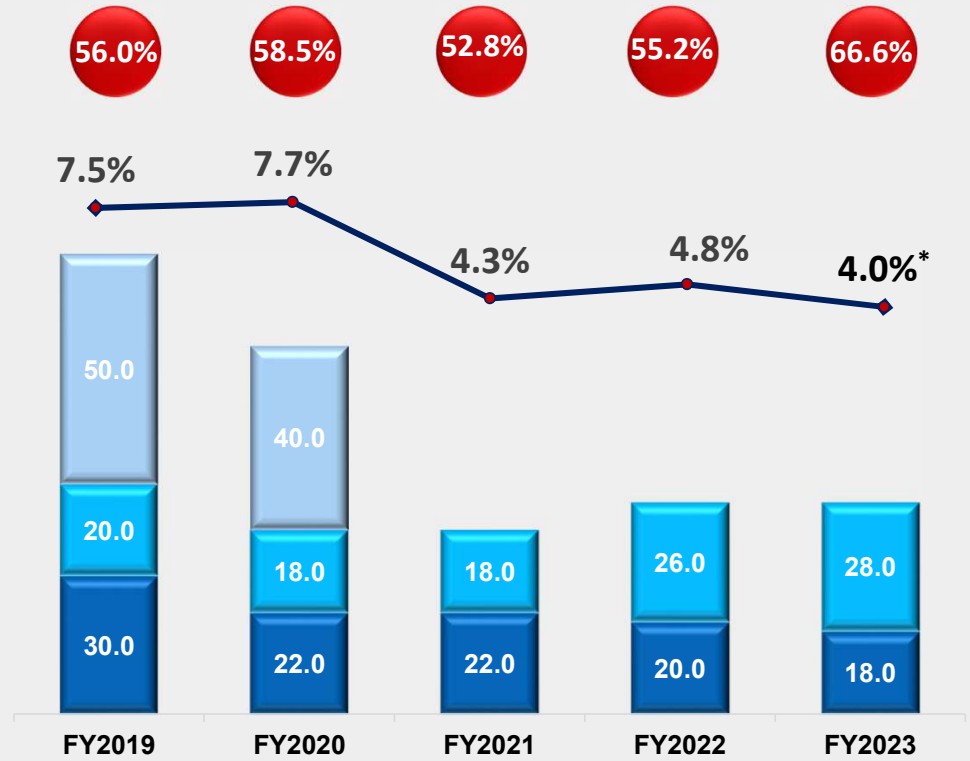
2024 Internal Threshold: 50.0



Stability in regulated business performance enables us to reward shareholders while upholding our policy

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)

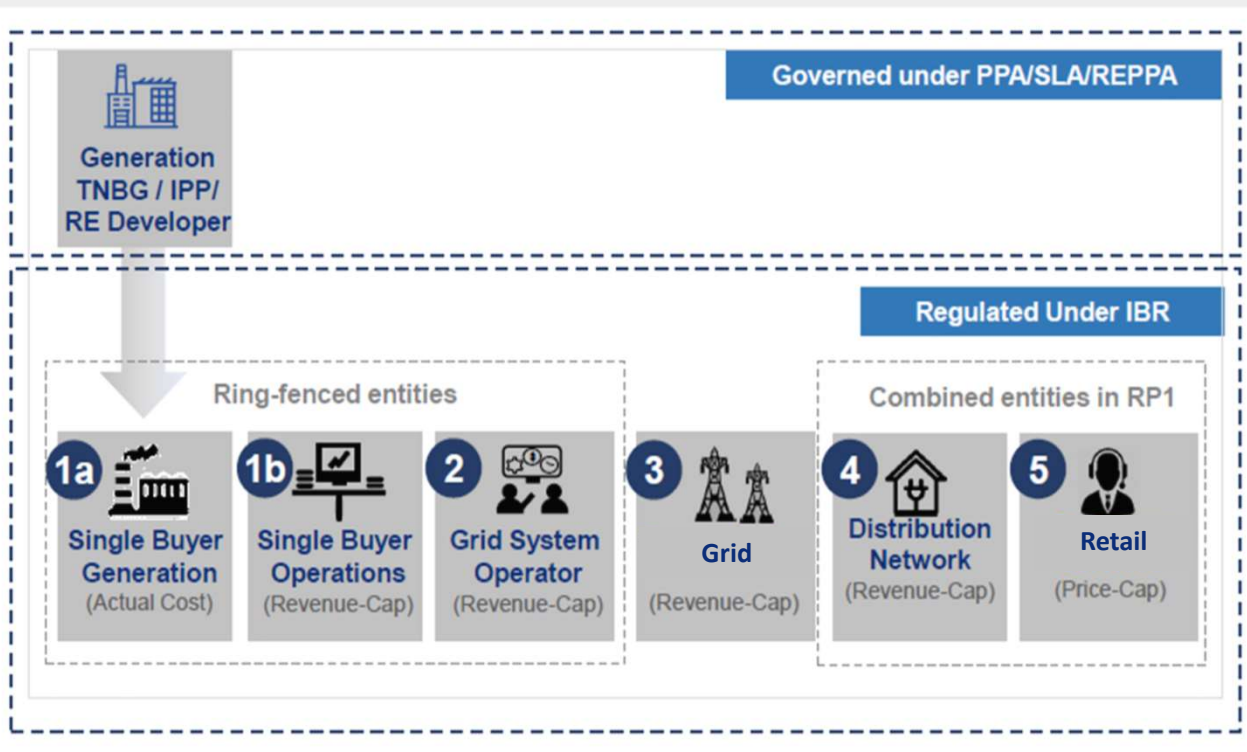
● Dividend Payout ratio (%) (based on Adjusted Group PATAMI and excluding special dividend)

◆ Dividend Yield

* Dividend yield as of 21 Feb 2024



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.



Regulatory > IBR Regulatory Period 3 (RP3) Parameters

2024 is the final year for RP3 while we seek for a fair outcome for RP4 (2025-2027)

RP3 determination (2022 -2024)



Base Tariff,
sen/kWh

39.95
RP2: 39.45



WACC, %

7.3
RP2: 7.3



CAPEX, RM bil

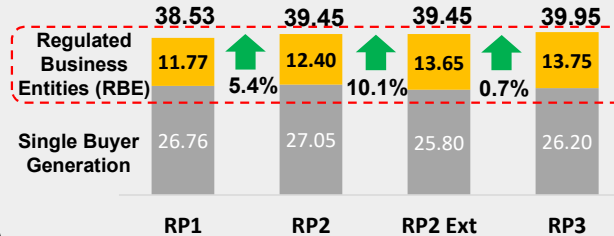
20.555
RP2: 18.8



RAB, RM bil

70.8
estimated closing
2024 RAB

Base Tariff
sen/kWh

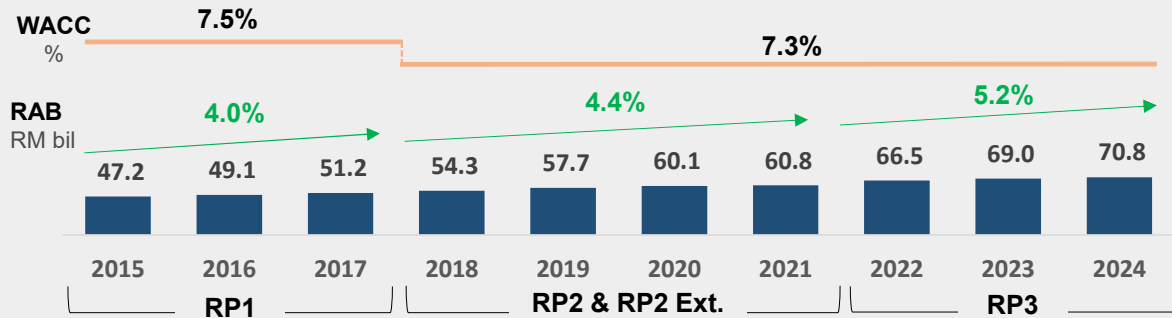


Upward trend of RBE tariffs since RP1 ensure continuous growth of regulated revenue

Regulatory Period 4 (2025 -2027)

- > Submitted RP4 proposal to regulator in early December 2023.
- > **Theme:** Delivering our customers' energy needs and facilitating Malaysia's Energy Transition
- > **Tariff Reform:** Towards cost reflectivity to ensure that the tariff is fair and equitable for the sustainability of the ecosystem

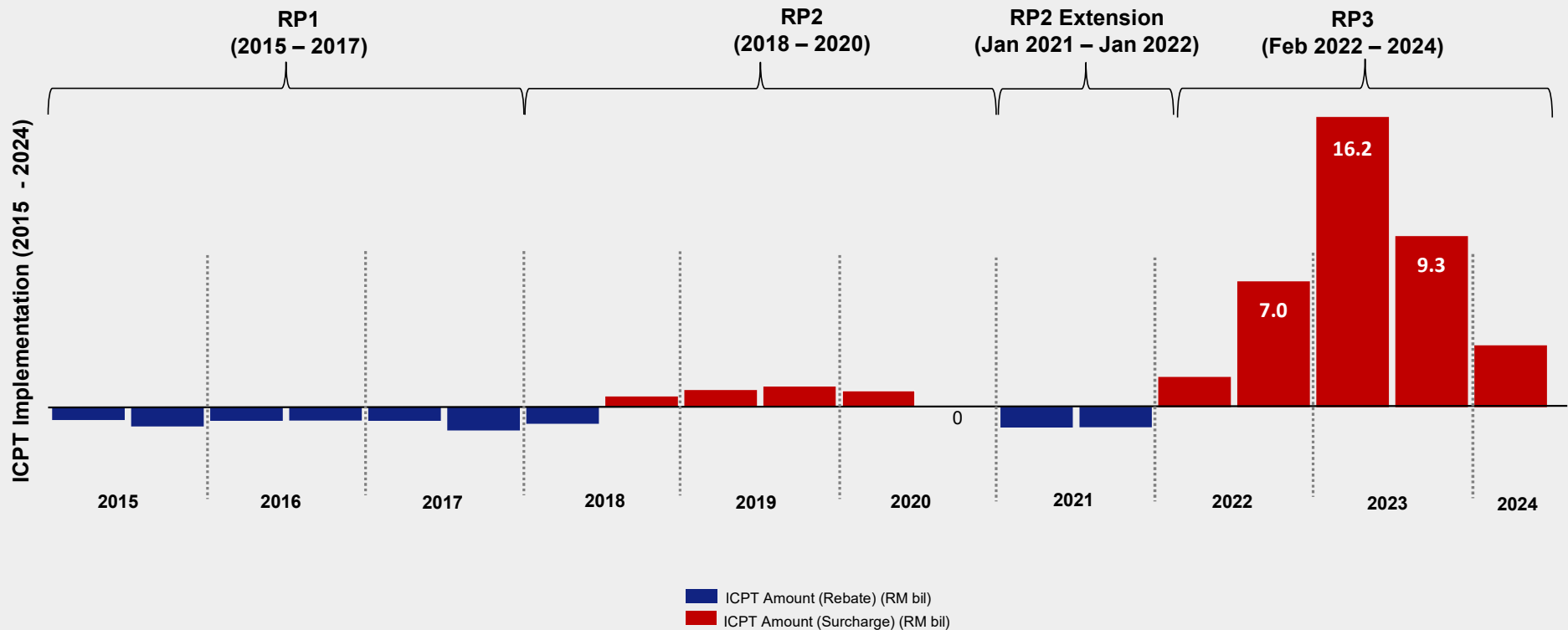
- WACC and return on regulated asset base (RoRAB) maintained at 7.3% since RP2
- Higher approved CAPEX guaranteed continuous growth in Regulated Asset Base (RAB) and earnings





Regulatory ICPT Mechanism

Regulatory certainty; the Government has successfully managed the impact of fuel prices volatility for the past 19 ICPT* cycles since 2015 with the highest ICPT cost recovery in FY2023.



ICPT mechanism remained intact; ICPT receivables is expected to trend lower amid moderating coal prices, relieving working capital pressure with positive improvements in our cash flow position and gearing levels.

*Imbalance Cost Pass-Through



Our journey towards Net Zero 2050 Aspiration will bring positive business growth and enhance value to our shareholders, as well as support the nation's aspiration

Net Zero 2050 Aspiration

Our Target for 2025

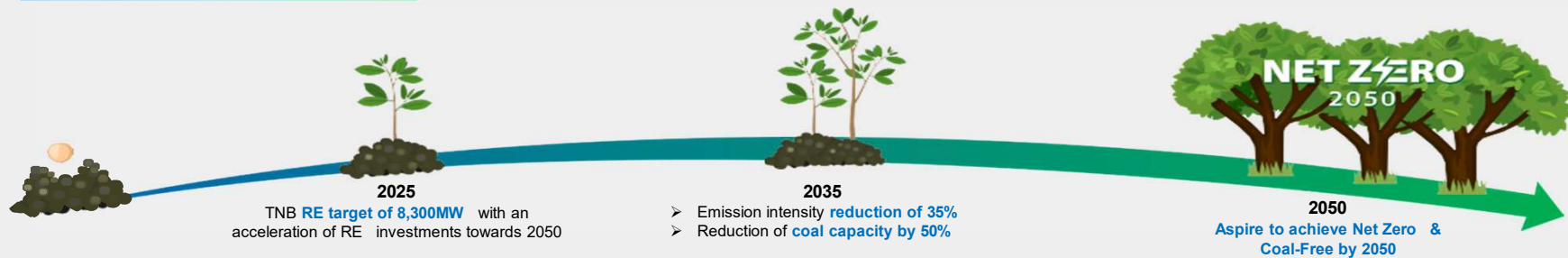
- Build scale in renewable generation
- Improve thermal plant efficiency

Our Commitment to 2035

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

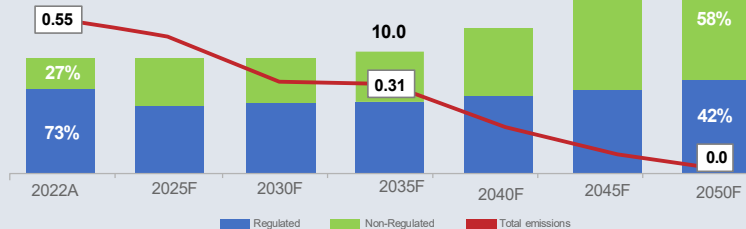
Our Aspiration to 2050

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



EBIT Projection

TNB GHG emissions intensity (tCO₂e / MWh)



Our future growth will be driven by the non-regulated business



Ranked 1st in the region and 42nd in the overall international ranking for Global ESG Monitor in 2022

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



Our Energy Transition Plan cuts across the electricity supply value chain, anchoring on three (3) key levers: Decarbonisation, Digitalisation & Electrification



ENERGY SOURCES

Renewable Energy (RE) Capacity

- Capture RE growth potential in domestic and international markets
- Embark on strategic partnership for new technology
- Adopt commercial capabilities in foreign markets to drive domestic RE growth

Coal Generation Capacity

- Uplift value of existing plants
- Reduce coal generation capacity
- Increase gas generation capacity

Carbon Management

- Reduce scope 1,2,3 GHG emissions
- Capture emissions (CCS, CCU)
- Trade/offset
- Manage carbon pricing



ENERGY VECTORS

Smart Grid

- Enhance grid & network flexibility to enable higher penetration of VRE¹, DER² & electrification

Regional interconnection

- Expand cross-border interconnection allowing for a wider reallocation of RE resources in ASEAN power system

Hydrogen

- Produce for applications in domestic power, industrial and mobility sectors, and for export market

Energy Storage

- Stabilise the grid
- Manage grid's peak demand
- Enable off-grid supply and peer-to-peer generation among prosumers



ENERGY USAGE

Electrification

- Spur the development of low-carbon mobility ecosystem

Energy Efficiency

- Provide energy audit services and integrate energy efficiency improvements on machinery, equipment & appliances
- Deploy energy monitoring system

Prosumer

- Provide rooftop solar + storage solution

Digital Platform

- Complement Energy Transition (ET) initiatives with digital platforms such as myTNB apps, Electric Vehicle (EV) charging platform, digital marketplace and green energy aggregation and trading platform

Smart Cities

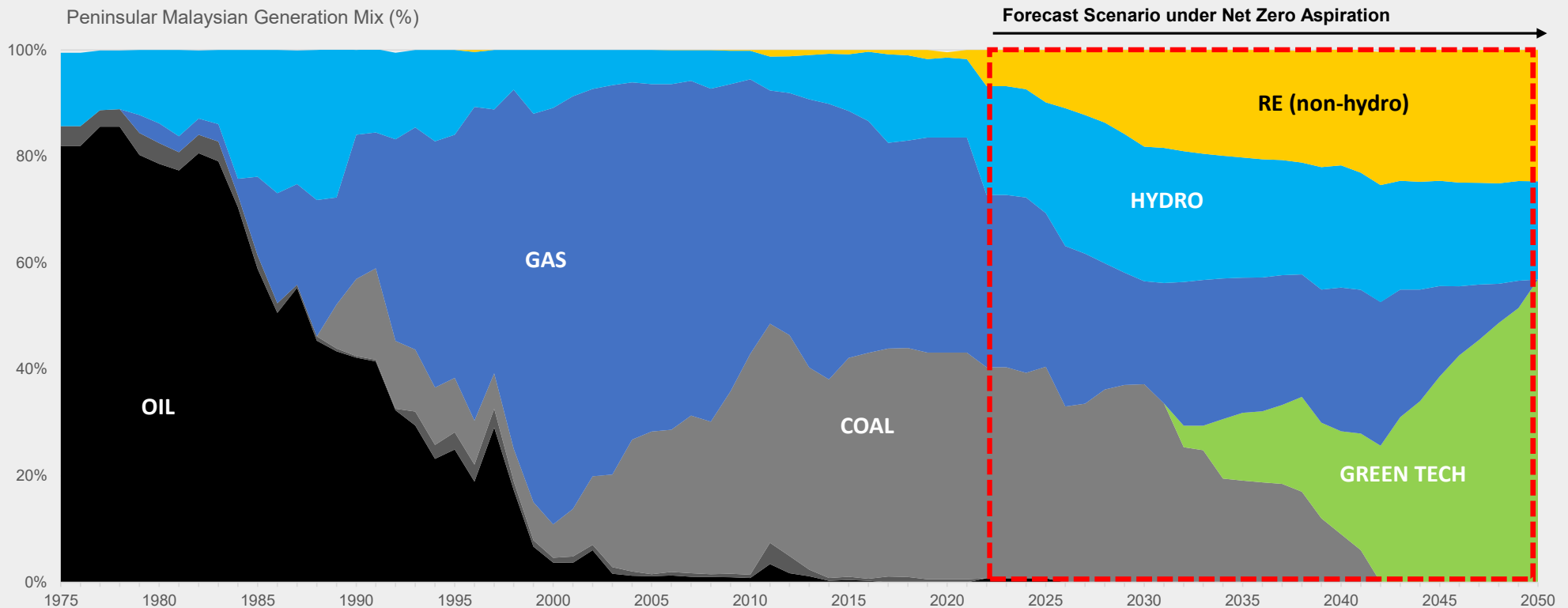
- Develop liveable, sustainable and resilient cities leveraging on technologies and integrated functionalities

¹ Variable Renewable Energy

² Distributed Energy Resources



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 Energy Transition Plan **▶ Our growth story supports our ET agenda**



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

Energy Sources

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

Fast track decarbonisation

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

Explore opportunities in ASEAN



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

Pipeline capacity >7GW
(Existing total assets: 15.7GW*)

NED aims ~USD7 bil Equity investment by 2050



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

FOCUS MARKETS



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

Pipeline capacity >7GW
(Existing RE assets: 1.2GW*)

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



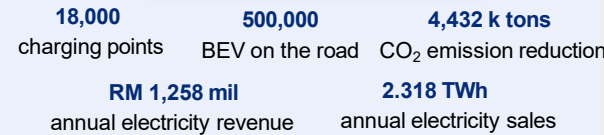
Potential Earnings by 2050: ~RM7 bil

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



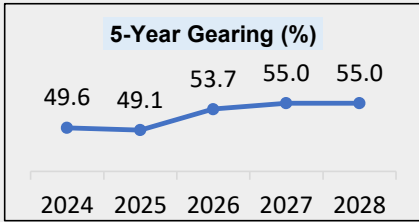
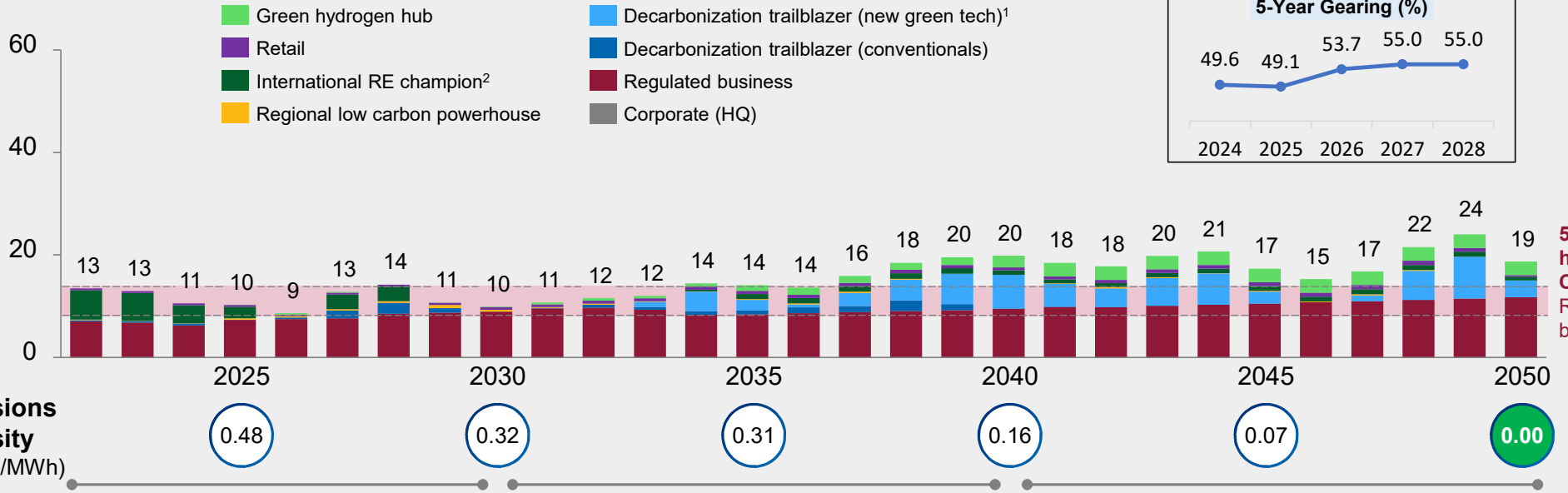
- 100% increase to ~250k users of Energy Budget features via myTNB (2025):
- 8,071 tonnes of CO₂ avoided from the potential savings of ~11GWh in household energy consumption

*Gross capacity



Pathway will require investment of RM10-20 bil yearly over the next 30 years

Indicative TNB CAPEX³ (RM bil) Legend



5-year historical CAPEX: RM7-13 bil

Emissions intensity (tCO2e/MWh)

Key investment drivers

Indicative

Annual CAPEX

Total CAPEX

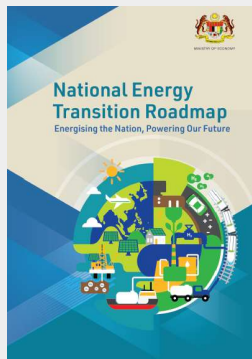
- | 2020s | 2030s | 2040s |
|---|--|--|
| <ul style="list-style-type: none"> Pursue RE in MY & globally (RE growth to offset plant expiry / early retirement) Use proceeds of coal partnership (2025) and NE-co IPO (2028) to fund RE | <ul style="list-style-type: none"> Begin repowering into new green techs in 2035 Rely on gas plants as transition fuel while waiting for new green techs to scale up Retire newer coal plants earlier (4 years) Establish and grow adjacent businesses (e.g., green H₂ production, EV charging) | <ul style="list-style-type: none"> Pursue new green techs more aggressively as economics improve and CAPEX headroom increases from returns in earlier investments Phase out gas plants by 2049 Expand green H₂ business to tap into rapidly increasing domestic demand |
| <p>Annual CAPEX: RM 9-14 bil</p> <p>Total CAPEX: RM ~90 bil</p> | <p>Annual CAPEX: RM 10-20 bil</p> <p>Total CAPEX: RM 140-145 bil</p> | <p>Annual CAPEX: RM 15-24 bil</p> <p>Total CAPEX: RM 210-215 bil</p> |

1. New green tech includes nuclear SMR, CCGT + CCUS, and green H2 CCGT; 2. RE includes solar and wind; 3. CAPEX accounts for equity stake; Source: Internal analysis,



The NETR aims to shift Malaysia from a traditional fossil fuel-based economy to a high-value green economy

Responsible Transition (RT) Pathway 2050
to shift Malaysia's energy systems from fossil fuel-based to greener and low-carbon systems



Aligned with the national aspirations and commitments to sustainable development

The **Twelfth Malaysia Plan 2021-2025** which outlines aspirations for the nation to achieve net zero emissions by 2050.

The **National Energy Policy (DTN)** launched in September 2022 with aspirations to become a low carbon nation in 2040.

Review of RE policies

- 1 To increase the country's installed RE capacity from 40% in 2035 to **70% by 2050**,
- 2 To introduce the concept of a **self-contained system according to the "willing buyer, willing seller" principle** to the RE development framework,
- 3 To increase the **installation of solar systems on government buildings**, and
- 4 To allow **cross-border RE trade** through the establishment of an electricity exchange system, complementing the ASEAN power grid initiative.



NETR Part 1
(6 energy transition levers)

Optimise



Energy efficiency

Shift to Renewables



Renewable energy



Bioenergy



Hydrogen



Green mobility

Abate



Carbon capture utilisation and storage (CCUS)

NETR Part 2
(Focus on biomass, waste-to-energy usage, CCS and hydrogen integration)

- 1 Establish the National Energy Council
- 2 Set up the National Energy Transition Facility (NETF) with a seed fund of RM2 billion
- 3 Establish and launch a RE exchange in 2024

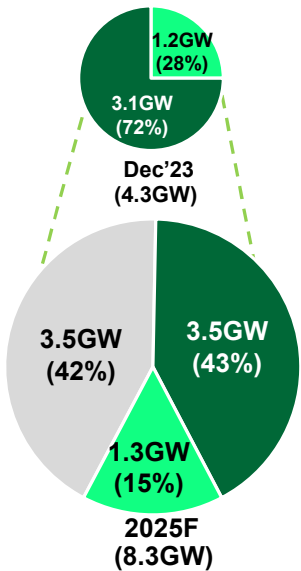


We remain resolute in delivering our RE target capacity of 14.3GW by 2050

Champion for 3 flagship catalyst projects

- Establishment of Large Scale Solar Parks over 5 sites, each with 100MW capacity,
- Development of Hybrid Hydro-Floating Solar (HHFS) at existing dams with a capacity of 2,500MW, and
- Co-firing of Hydrogen and Ammonia at our power plants.

8.3GW RE target capacity by 2025



Achieved
> 50% of target capacity
of 8.3GW by 2025

- Domestic
- International
- Potential Growth

RE portfolio



4.3GW
Dec 2023

2,700MW
62.8%

1,301MW
30.2%

284MW
6.6%

12.5MW
0.3%

4.8MW
0.1%

Additional capacity

+513MW

- i. Solar Greenfield UK
- ii. CGPP
- iii. HHFS Phase 1

MWp (COD)

- 102 (2024)
- 135 (2025)
- 276 (2025)

4.8GW*
by 2025

2,700MW
61.3%

1,814MW
32.3%

284MW
6.1%

12.5MW
0.2%

4.8MW
0.1%

8.3GW

Target by 2025

*Confirmed Capacity including pipeline
Note: Installed capacity for solar plants based on MWp

Thank you

INVESTOR RELATIONS GROUP FINANCE DIVISION

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